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ABSTRACT

This report is an outline of a system of indicators for evaluating performance of educational systems and grows out of OECD work on social indicators. Existing statistical data on education consists of "inputs". The desire expressed in this study, however, is to measure "outputs" or actual system performance. Whenever a relationship exists between a statistical measure of education and a notion of welfare or well being it is called, for the purposes of this report, an indicator; i.e., it measures output or performance. In elaboration on possible goals of education, indicators have emerged "naturally" in this report. After a short introductory chapter, the second chapter discusses approaches and methods toward selection of goals, evaluation and construction of indicators. Possible goal areas in education discussed in chapters 3-7 are "Transmission of Knowledge and Skill," "Education and the Economy," "Equality of Educational Opportunity," "Provisional Educational Services for Individual Requirements," and "Education and the Quality of Life." These chapters make precise statements on the different emphases that are possible inside a general area and, within those "subareas", discuss possible indicators and the assumptions required for their construction. When a specific indicator emerges from the consideration of goals, the policy implications of its variation are discussed. ED 069 018-ED 069 023 are related documents. (JH)

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Preface

In 1970, the OECD organised a Conference on Policies for Educational Growth to review developments of the preceding decade and draw up guidelines for the 1980s. The Conference recommended further work on indicators of the performance of educational systems(1).

Since 1970, the OECD has gone ahead to examine the problem of establishing a comprehensive set of educational indicators, and the present report - Indicators of Performance of Educational Systems - is one of the first fruits of its efforts. It was written jointly by Roy Carr-Hill (Lecturer in Sociology, University of Sussex) and Olav Magnussen (a member of the OECD Secretariat).

The report, which is intended to provide a general survey of the problems involved and the existing literature, concentrates on types of measure which are not yet in widespread use and touches only lightly on non-traditional statistics on enrolments, teachers, etc. which have been extensively discussed in OECD publications.(2) It makes a number of suggestions for new educational indicators (which are underlined in the relevant parts of the text), but these are not worked out in detail, and attempts to portray a statistical framework wide enough to embrace the range of common concerns of Member governments in the field of education, as seen by the authors. It is hoped the report will provide a useful starting point for the wide audience interested in this field.

Although work on this study was carried out under OECD auspices, it does not necessarily reflect the views of the Organisation or the Member countries.

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1) See the General Report on the Conference published under the title Educational Policies for the 1970s, OECD, Paris, 1971.

2) See Methods and Statistical Needs for Educational Planning, OECD, Paris, 1967.

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Roy Carr-Hill

Olav Magnussen

Chapter I

INTRODUCTION

This paper attempts, as part of the overall OECD work on social indicators, to outline a system of indicators for evaluating the performance of the educational system. It was written as a result of the need to develop more relevant measures for evaluating the performance of social systems.

This need itself probably originates from the perceived deficiencies of broad economic indices such as GNP in measuring the well-being of nations in a wider sense. This subject area is only in its infancy, and therefore this work aims at presenting the conceptual problems involved, rather than proposing direct statistical measures or discussing the statistical feasibility of proposed indicators. Existing statistical data on educational measures are, for the most part, what in economic terms would be called "inputs" to the system, i.e. costs, number of pupils and teachers, school buildings and so on. The essential feature of the use of social indicators is that, wherever possible, they measure "output", i.e. the actual performance of the system and its success in achieving the aims set before it.

The concept of "output" or performance is relative to the level of generality on which one operates. What is a measure of input at one level can easily become a measure of output or an indicator at another level. For example, GNP is usually a measure of output but must be regarded as an input to overall social welfare. Therefore at the highest level of generality, i.e. the level of social welfare, all the indicators proposed in this paper must be regarded as inputs. Such a construction as "the level of social welfare" does not, and probably never will, exist.

Whenever we felt there was a relationship between a statistical measure and this vague notion of welfare or well-being, we have called the measure an indicator, i.e. it measures output or performance. This

emphasises the normative aspects of the "indicators" we have chosen. Therefore an explicit discussion of goals is the precondition of a sensible discussion of indicators(1).

But to limit discussion to indices which measure output only is not sufficient. In some of the models discussed, indices will present themselves which can be given no normative meaning in most instances, but which will be very important as information about the overall operation of the system. These indices we have called social statistics. Chapter II contains more detailed discussion on concepts and methods of measuring them.

Most of this paper is an elaboration of the possible goals of the educational system, and the appropriate indicators have emerged "naturally"(2). It will be seen that most of the proposed indicators are not included, at present, in the statistical system at all. This we believe is a reflection of the state of thinking with respect to educational goals and social statistics. If we care how we perform and therefore want information on our performance, we shall have to include new statistics. But before we propose the collection of yet more information we must examine in depth the concepts which we want to measure: that is the purpose of this paper. But we should not forget the necessity for these other data and for their systematic collection in the manner suggested in Methods and Statistical Needs for Educational Planning(3).

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1) The relationship between outputs and inputs is not a single fixed and permanent relationship, but is in a constant state of flux. Sometimes it is not even possible at the conceptual level to distinguish between the two concepts. An example might show the problems here: a person is at a restaurant with friends having a good time - the outputs are easily identifiable, but what are the inputs? They include food, drink, the individual's psycho-social readiness for a good evening, and atmosphere. But the last-named inputs and outputs are qualitatively different from the others, they are on the borderline between inputs and outputs, conviviality both produces and is produced by a good atmosphere. A similar example can be taken from this paper: if education is valued for its own sake then the individual student both produces, and is produced as, an educational product. These two examples might be used to criticise the distinction between inputs and outputs. But the cases where it is not possible to classify variables according to outputs and inputs will often be of the kind described in the paragraph below, i.e. phenomena measured by social statistics.

2) This refers only to the first stage of this project, i.e. indicating which indicators are feasible. In order to choose the correct indicator, empirical comparisons of the phenomenon and the chosen measures are required.

3) OECD, Paris, 1967.

On the other hand, most existing educational statistics have been compiled for budgetary control purposes, which means that even if some of them might be used as indicators, they will have consequences only for the content of the budget. Further development of the present system in the direction of making the existing measures and statistics more accurate is, from our point of view, not the most urgent task(1), for most of the available statistics are relevant only for measuring inputs, while this paper concentrates on the outputs of the educational system. This does not, in general, rule out the use of traditional inputs as indicators of educational performance. Even the number of teachers employed by the school system could be an indicator of educational performance if it had previously been established that more teachers mean more learning, all other factors constant. In this paper we have, in fact, used factors of input as measures of performance when the output or performance is impossible to measure, often on the basis of belief, rather than evidence, that these inputs influence what we really want to measure(2).

The statistics to be collected will have to be generated within a common framework. It is therefore proposed that, as far as possible, indicators for the educational system be developed within a general system of social accounts. Richard Stone's Demographic Accounts(3) might be a useful point of departure(4). We envisage that such an information system would be established to meet the particular need of each Member country and the indicators we propose are those likely to be generally useful but we do not intend them to be taken as a basis for international comparison.

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1) Note that we are <u>not</u> discussing the utility of these statistics; on the contrary, when we begin to examine the responsiveness of our indicators to various factors we shall require those statistics which have been compiled for budgetary purposes.

2) Here the appropriate name for this measure is probably "social statistics".

3) R. Stone, <u>Demographic Accounting and Model Building</u>, OECD, Paris, 1971.

4) Note that the Stone system is only useful for collecting statistics in a consistent manner; we cannot evaluate our measures within this framework.

It will be noticed that this paper has not concentrated on any statistical or technical difficulties involved in the calculation of a valid indicator from the raw data which one proposed. This is because we believe the most complex and difficult problems involved are conceptual and theoretical and are basically problems of classification. Once appropriate data can be specified and are collected on a sample basis the choice of summary measures from the raw data will be largely empirical, i.e. in terms of which index is most sensitive to the phenomena studied(1). Therefore the main problem is to specify the phenomena, and what is involved in this approach.

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1) Note the difficulties inherent in this approach. As long as we deal with a simple phenomenon such as enrolment, there are no problems. But when we consider more intangible goal areas, it is unlikely that we shall arrive at a consensual definition of any aspects in these goal areas. On the other hand, it is essential that we avoid what might be called the GNP trap i.e. the tendency to stick to easily measurable variables. This is a problem that can be resolved only by doing the utmost to include intangible goal areas within the general measurement system.

Chapter II

APPROACHES AND METHODS

We are attempting to outline the basis of a statistical information system which will enable us eventually to construct indicators of the performance of educational systems. However, if either the goals or desired states of the system are undefined or unclear, or the means to attain them are unknown, then no information is useful and anything or nothing will serve as an indicator. We have some idea of the goals towards which it is possible for an hypothetical educational system to aim but less idea of how to achieve them. However such ignorance is not an excuse for not collecting the raw data necessary for the construction of such indicators. For without some evaluation of performance, however crude, there is not much point in worrying about how we perform.

In this chapter, we shall first discuss the process by which we arrived at the goal areas we have chosen, and what these areas are. Then we shall specify what we mean by social indicators and discuss the problems inherent in their construction. Finally, these discussions will allow us to develop a programme for dealing with each of the areas to which education may be relevant.

A goal area may be defined as an area in which society has continuing interests or concerns, and to which education is related.

Our approach in this report is to specify clearly what could be implied by a given, broadly defined, goal area. In this way we can discuss sensibly what would count as performance towards these goals, and what information is necessary for us to evaluate these goals.

It has been argued that it is not social systems which have goals, but the different individuals in the system. One extreme view is that individual goals can easily be aggregated (for example the arithmetic mean) and that this aggregate should be taken as the objective of educational policies. This implies that the well-being of different persons is directly comparable. The other extreme view holds that we cannot decide the goals of an educational system, because such interpersonal comparisons are possible if we are willing to make judgements of an

essentially ethical nature. Such a comparison can be summarised in a welfare function(1) in which the well-being of one person is in some way added to that of another. But can this function be found(2)? In other words - does there exist some kind of framework which distils the various ethical beliefs of individuals into a consistent system? If we are content with fairly broad ethical judgements in moderately homogeneous societies, this may be possible(3).

The alternative approach defines needs(4) a priori from some broad conception of humanity. Such a conception might be something like the capacity to feel pleasure and pain, and the need for self-fulfilment. An alternative approach would be to define minimum requirements for social existence. We can see that needs could be either individual needs, the lack of which cause physical or mental harm, or social needs, without which a society would degenerate. The definition of such needs would not, of course, be easy. A further possibility is to maintain a strictly sociological stance that goals can be properties of organisations only. Our paper is neutral about this dispute, since we are considering ideal-type goals, i.e. goals which someone, some organisation or some state might have: we are not attributing them to any existent entity(5). To make this exercise as general as possible, we are prepared to accept both individuals' claims concerning the appropriate goal-structure for education, and organisational or societal claims on the educational system.

It is emphasised that this dispute is not purely academic, since it has specific consequences for the sorts of indicators which would be proposed. For if we were attempting to construct an aggregate welfare function, the parameters we should use to measure our progress would normally be in terms of the supply per capita of a desired goal. Thus we

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1) Note that we are discussing well-being in general, not only economic well-being.

2) See K. Arrow, Social Choice and Individual Values, P. Wiley & Sons, New York, 1951.

3) For a detailed discussion, see J. de V. Graaff; Theoretical Welfare Economics, Cambridge University Press, 1957.

4) Such needs are quite different from the traditional economic term "demand", which is expressed by the market, or "preferences", which are measured by demand. For a pauper has needs but cannot demand and a millionaire has preferences but no unfulfilled needs in economic terms.

5) For a discussion of minimum requirements for social existence see W.G. Runciman's Social Science and Political Theory, Cambridge University Press, 1st Edition 1963, 2nd Edition 1969.

should choose an indicator such as 'average number of years of education'. This is a measure of the educational resources available to a population. However, if we are concerned with the distribution of welfare, we need to measure the extent to which a given level of provision is made for every individual in the society. Thus we are interested in such measures as the proportions of the population with certain numbers of years of education.

It may be remarked that this paper is laden with value assumptions; this is not denied, on the contrary it is hoped that values are clearly expressed. The fact that the goals are sometimes conflicting does not preclude a discussion of what counts as performance towards these goals. It is not possible to say, as Weber(1) does, that once the goals have been chosen, then the remainder of the exercise is objective and value-free. For the ways in which problem-solving proceeds depend on the sorts of reasons which are regarded as relevant by the problem-solver and on the particular paradigm of the educational system. Moreover, the notion of rational argument itself is also partly dependent on paradigms of explanation of the educational process. We must also be careful to distinguish between educational policies oriented towards certain goals and the attainment of these goals. On the other hand, policies designed to meet certain goals may become goals in themselves. Thus, we shall consider equality of access both as a final goal, and as intermediate to some such goal as equality of result(2).

1. SELECTION OF GOALS

The logical way in which to approach this would be to construct an appropriate classification of goal structures for modern industrial societies. This would have to be an agreed analysis of all social, political and economic phenomena. We would then be able to propose a corresponding system of social accounts which would allow us to collect information monitoring the movement of societies within the multidimensional framework. Finally we could examine the part played by the educational system in contributing towards performance along each of the dimensions of the agreed classification.

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1) M. Weber, The Methodology of the Social Sciences, Glencoe Free Press, 1949.

2) For a discussion of these goals see Chapter V.

There are various possibilities: thus Gross(1) proposes a classification of social, political and economic goals. Parsons(2) analyses societies in terms of five contrasts. We would need such classifications if we were to attempt to discuss possible conflicts of goals. However, the development of a sociologically significant set of categories which capture present, past and future social structures is liable to be a time-consuming task(3). Moreover the information which we are likely to be able to collect would not fill out such a complete analysis. Any other solutions require either a benevolent dictator or a social survey of happiness(4). There has been an attempt (by Richard Stone) to develop a system of social accounting, but this has restricted itself to easily measurable quantities such as numbers and types of pupil, and is in no way linked to a theoretically significant classification of goal structures. Lastly, the interdependencies between the educational system and society are only beginning to be analysed. At the moment there is a mass of conflicting results due partly to methodological difficulties but also to theoretical disagreements.

There appears to be broad agreement that the educational system, at least in recent decades, slots rather neatly into the social structure. Alan Little(5) states that:

> "Pupil performance in the system is in part - and many would argue in large part - a function of what the pupil brings with him to the system, not what the system provides."

A similar conclusion has been drawn by J.S. Coleman in his study on equality of educational opportunity(6). Thus he showed that the traditional variables which educationalists assumed would alter performance, such as teacher/student ratio, facilities, etc. have little

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1) B.M. Gross, The State of a Nation, Tavistock, 1966.

2) T. Parsons, Structure of Social Action, Glencoe Free Press, Illinois, 1949.

3) See an attempt by J. Galtung in Futures, September, 1970.

4) Neither of these seems sensible to us. Nevertheless both have been proposed as analytic tools. See de V. Graaff, op. cit., for critical discussions.

5) Conference on Policies for Educational Growth, Vol. V, OECD, Paris, 1971.

6) J.S. Coleman, et. al, Equality of Educational Opportunity, United States Office of Education, 1966.

effect on performance. The most important variables for predicting performance were those which measure the out-of-school environment for the pupil, for instance social class, etc. One may argue about the relative importance of home background, school and teacher variables(1), but there is no doubt that home background is important.

Evidence also suggests that if the incentives of the labour market are different from the economic goals as seen by the educational system, then the former will be the decisive factor in allocating educated labour to the different sectors of the economy(2).

Overall, the effectiveness of education as an instrument for social change, whether from an individual or societal point of view, is placed in doubt. The performance of the system is primarily affected by factors outside its control (referred to above as exogenous factors). Only when the goals of society as a whole and the goals of education coincide can we expect that education will be able to effect the movement towards fulfilment of these goals. As expressed by Harman(3) - "For, just as the beliefs and values of a society determine the kind of educational system it chooses to set up, so does the educational system affect what beliefs and values are either perpetuated or changed". Education does not appear as a great social leveller.

This is not the whole picture however. The factors which limit the capacity of education to achieve change are the following:

1. The inadequacy of resources given to education;
2. The ineffectiveness of the educational system due to pupils entering too late and leaving too early;
3. The nature of the educational programmes;
4. The lack of planning and evaluation of educational systems.

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1) See Conference on Policies for Educational Growth - Group Disparities in Educational Participation and Achievement, Vol. IV, OECD, Paris, 1971.

2) P.J. Foster. "The Vocational School Fallacy in Development Planning", Readings in the Economics of Education, UNESCO, 1968.

3) Conference on Policies for Educational Growth, Vol. VIII, OECD/CERI, Paris, 1971.

Nestor Terleckyj(1) eloquently described the present state of the art as follows:

> "Social change is being produced by very backward industries. Most of their products are not designed, they happen. Important issues in product mix, new product development, consumers research, industrial organisation and pricing are being approached as a matter of course by faith and emotion rather than by serious design. The science base for such activities as education, design of living environment, welfare and most others, does not exist. Goal analysis will not bring any magic and any single research effort may not count for much, but it is important to try to contribute to an increase in rationality in this sphere. It would be a mistake to gloss over the primitivism of design and of knowledge of both private and public activities undertaken in pursuit of social goals. Compared to the care given, and properly given, to say the design and operation of a commercial airliner or the development and marketing of a new drug or even a cake mix, regarding the seriousness of approach, the willingness to undertake research on a serious scale, and the respect for facts and for the customers evidenced by both public and private organisations and elements serving these ends, the actual approaches in designing the schools our children go to, the neighbourhoods we live in, or the manner in which we take care of our health is appallingly primitive."

This more optimistic view of the potential for social and economic change is based on the belief that the educational system, among others, has never been given a chance to be effective towards the goals set up for it. Inattentiveness and low performance must be expected when so little has been invested in performance towards specific targets or in understanding the actual functioning of the system in general.

So we believe that it is useful to set up goals for education, with a realistic hope that education could have some effect in these areas. However, if one does not allow for a much larger effort in research and

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1) Management Science, August, 1970.

development, the effectiveness of education as an instrument for promoting social and economic change may be very limited. Also the whole problem of providing useful indicators is intimately connected with research and development. Without a much deeper knowledge of how the educational system actually works, the hope of establishing valid indicators will have to be abandoned. We need data on the structure of the educational system before we can choose measures which will have evaluative significance, i.e. indicators.

We decided to adopt an eclectic approach to the selection of goal areas for educational systems. We have not carried out, nor do we propose, systems analysis of present educational systems. It could be interesting to ask "what are the actual goals of the educational system as implied by the way it functions?" and "do we like what the educational system produces?". It is probable that we would end up with some unpalatable answers like those of Reimer(1) that the major services that educational systems provide for a society are custody and certification(2). Moreover, every system fulfils its goals articulated in this manner, so indicators of performance would be redundant.

Neither have we attempted to produce a classification of goals which required us to define basic needs, or to construct an aggregate welfare function (both of which would strain our knowledge base). We decided to adopt another also sociologically respectable stance. We have distilled from the policy statement of educational decision-makers those goals which have seemed politically important at one time or another, whether or not they are actually being attained, or progress is being made. We have arranged them in the order in which they have been historically important.

Thus we have decided to examine the relationships of the educational system to society (with a view to evaluating its performance) in the following five goal-areas:

1. Transmission of Knowledge and Skills: Chapter III.
2. Education and the Economy: Chapter IV.
3. Equality of Educational Opportunity: Chapter V.
4. Provision of Educational Services for Individual Requirements: Chapter VI.
5. Education and the Quality of Life: Chapter VII.

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1) See "Second Annual Report of the Seminar on Alternatives in Education", Centro Intercultural de Documentacion, Cuernavaca, Mexico, September 1969.

2) See however a very good attempt by L. Johansson in "Utdanning Resonerande del," Långinkomstutredningen, Kap 7, Stockholm, 1970.

Moreover this classification has the immediate practical advantage that research has often been directed to answer policy questions in precisely these areas. So we can move ahead with the construction of viable social indicators without instigating research into the relations between education and society in these areas.

In the following chapters the goal areas are considered in turn, and appropriate indicators are suggested. Member countries (and groups of them) will have their own structures of goals, which may, or may not, coincide with the set of goals chosen above. Yet this indicator exercise had to choose some goals especially within the more nebulous areas; it could not confine itself to vague goal areas. Therefore, the choices which have been made at this early stage are partly illustrative, and should not be read as an OECD view on educational policy.

But it is important to attempt to measure performance in such areas, since anything which cannot be measured is liable to be undervalued(1). This would be especially acute in one area which we have purposely omitted i.e. the role educational systems play in the transmission of values. This is not because we think it unimportant, but because it is especially arbitrary.

We have not attempted to combine the goal areas into our overall social welfare function. Our ordering of chapters reflects the chronological sequence in which these issues were seen as important by policy-makers. Moreover the length of the different chapters should not be taken to reflect the weight we attach to the different goal areas, but rather the controversies surrounding certain indicators, e.g. rates of return, or the lack of knowledge, with others, e.g. creativity, use of leisure, etc. It is also essential to remember that we are discussing these goals in isolation. Thus we shall often refer to an ideal educational system when we consider one particular goal area. It may be far from ideal from other points of view(2).

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1) See W. Gorham, "The Uneven Visibility of Social Problems", American Sociological Review, 1968.

2) We have avoided this problem in this paper; partly because of its complexity - since we should have to understand the educational process better than we now do; and partly because we believe that goal conflicts should be resolved in the political arena (see Chapter VIII).

2. WHAT IS AN INDICATOR?

The field of social indicators has blossomed over the past decade(1). We shall very briefly summarise the present position, and discuss our approach to the problem of deriving such indicators.

There are two opposite views as to the definition of a social indicator. On the one hand there are those who have adopted the position that relevant measures should be measures of welfare and consequently concentrate only on social indicators, i.e. measures of output or result. Thus in "Towards a Social Report" (Department of Health, Education and Welfare, 1969), it is said that:

> "A social indicator, as the term is used here, may be defined to be a statistic of direct normative interest which facilitates concise, comprehensive and balanced judgments about the condition of major aspects of a society. It is in all cases a direct measure of welfare and is subject to the interpretation that, if it changes in the 'right' direction, while other things remain equal, things have gotten better, or people are 'better off'. Thus statistics on the number of doctors or policemen could not be social indicators, whereas figures on health or crime rates could be."

On the other hand, there are those who want to extend the depth of social reporting (i.e. the assessment of the condition of society vis-a-vis its aspirations, goals, or problems). In this case the defining criterion for a social statistic to be a social indicator is "membership in a social system model or a parameter or variable"(2).

We have preferred to reserve the term indicators for the normative-type measures, but want to emphasise the importance of an integrated system of information.

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1) See Part I of a paper entitled "Social Indicators" by B.Cazes, presented at a Conference in Ditchley, U.K., 1971.

2) K.C. Land, On the Definition of Social Indicators, 1971.

Without such comprehensiveness , we cannot specify correctly the phenomenon nor the samples of causal relations surrounding the phenomenon, and the hope of establishing valid indicators disappears.

We have set out to suggest a framework for a statistical information system which will monitor educational policies. As such, any social reporting which is relevant to an evaluation of performance, whetner it be social statistics or social indicators, should be included. Our criteria of relevance will depend on various models of the ways in which the educational system affects the various institutions of society which we shall be considering. But different models that represent the workings of the educational system will often require the same raw data. Thus, we shall be discussing both the raw data necessary for good comparative social reporting and the construction of indicators. Different indicators can be derived from such raw data under different assumptions about the ways in which the educational system is related to society in the specific area. We shall consequently be recommending either: the collection of statistics on a regular basis, where the information is of proven value; or pilot surveys in different countries where the theoretical basis is soundly established; or the sponsoring of research to resolve theoretical controversies(1).

There are, of course, major difficulties in simply measuring the phenomena in which we are interested, and our initial problem is one of classification(2). The attempt to operationalize a social phenomenon often entails a form of concept reduction to that which is measurable(3).

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1) This research could either take one of the traditional forms or be a variant of what is called 'institutional experimentation' when we capitalise on the occurrence of natural differences by carefully designed controls.

2) We shall often propose measures which we consider appropriate only within certain ranges of foreseeable educational systems. This is unlikely to be a disadvantage, since we shall almost certainly have changed our goal structure before we approach the limits of their applicability. Moreover, the search for universally applicable measures is not very fruitful in the present state of the social sciences.

3) See A. Etzioni and E. Lehman, "Some Dangers of 'Valid' Social Measurements", The Annals of the American Academy for Political and Social Science, September, 1967.

Difference of emphasis also occurs between those who stress measures of aggregate welfare and those who stress the distributive aspects of welfare. The consequences for our evaluation of the educational system are very different. Consider the example of the supply of language teachers. Why should we normally measure this by the aggregate measure "number of language teachers per head (of the school population)"? Surely we are more interested in the proportion of the school population who get linguistic instruction appropriate to their requirements. And it would be even more interesting to know how many individuals in the population can function linguistically. The first tells us how the language-teaching section of the Teachers Association will be, the second something about the quality of linguistic instruction, and the third something about the linguistic competence of the population.

Suppose, for example, that the increasing complexity of society doubles the required working vocabulary for an individual to function with reasonable autonomy in a society, and suppose that we double the number of language teachers in order to educate individuals to the same degree of functional literacy. Our three measures will give different results: the first tells us that the number of language teachers per head has doubled, which appears as a sign of progress; the second that the probability of an individual getting an appropriate education is the same; and the third, that it is more complicated to be autonomous than before, despite the educational system.

Depending on our knowledge of the processes involved, we can be more or less certain that a given index monitors the progress of achievement with which we are concerned. Some indices may be even more confusing, since they appear to indicate performance aimed at various sub-goals of the system in opposite directions. For example, drop-out rates may be a healthy sign of flexibility, or a sign of teaching inefficiency. If we were interested only in the overall performance of the educational system aimed at (in this case) "democratisation" or "equality", we should have to use more reliable indices of equality. But if we can isolate specific emphasis within a goal-area, we may be able to use a measure in a number of different directions.

In other words, an index can very well be used within two different goal areas in opposite directions. It is only if the index conflicts in measuring the same phenomenon that we have to discard it. For most goal areas, we have only scant knowledge as to the feasibility and validity of the measures proposed; only further research can light the way for sensible use.

The validity and feasibility of the indicators proposed can more easily be judged in a realistic way by regarding the interaction between education and society. It is obvious, for example, that within each of the proposed goal areas there are factors which not only are influenced by education but also influence education, sometimes very decisively. In other words, the educational system is part of a larger interdependent system, where the causal relationships are far from clear; in many cases it might not be very fruitful to look for causal relationships at all.

In addition, these five goal areas are also influenced by systems other than the educational system. Therefore only a part of the total development within any one of the goal areas can be attributed to education. The disentanglement of the contributions of the different factors will be, in many cases, a serious statistical problem.

To sum up: We see the educational system and the five goal areas connected to each other by the interdependent system and influenced by outside forces having an impact both on the educational system and the goal areas.

3. PROBLEMS IN DERIVING AND EVALUATING INDICATORS

Space will not permit us to discuss in detail the consequences for educational indicators drawn from this model for each goal area, but we shall give a few examples, bearing in mind that these apply to all goal areas.

a) Given the exogenous(1) influences, the usefulness of statistical measures of performance will be influenced by the degree of interdependency. In some cases it is possible to construct recursive(2) or path models which, while exhibiting a certain form of interdependency, allow for determining the effect of educational policy within one of the goal areas.

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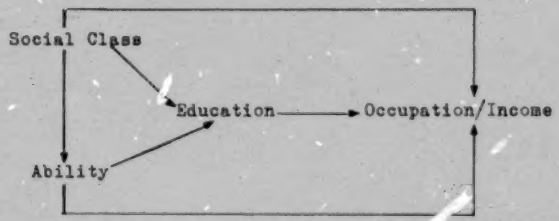
1) An exogenous variable is a variable which is not explained by the model, but is considered to be determined independently.

2) A model is said to be recursive if there exists an ordering of the endogenous variables (variables explained by the model) and an ordering of equations such that the ith equation can be considered to describe the determination of the value of the ith endogenous variable during period t as a function of the exogenous variables and of the endogenous variables of the index less than i.

A typical example of a recursive relationship is provided by longitudinal studies, where parental social class and income influence children's ability and choice of education. These in turn determine the occupation and income of the child as an adult (see Diagram I).

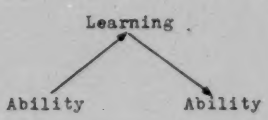
Diagram I



Note: The arrows indicate the direction of the causal relationship.

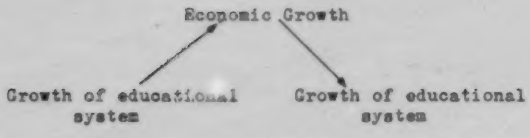
b) In many cases, however, this is not possible. In order to determine the effects of educational policy, and thus the indicator, a complete simultaneous model of the interconnections is needed. Apart from the statistical difficulties involved, the data and theoretical requirements for such a model outstrip present resources and knowledge. Thus, in order to construct indicators we shall often have to base our work on single-equation relationships which will give us a biased impression of the effects of education within a specific goal area. The existence of simultaneous relationships therefore clearly reduces the value of our indicators. Two examples are provided in Diagrams II and III.

Diagram II



Note: Diagram II shows that learning is a function of ability which is also influenced by learning. (In this case it might be possible to trace the recursive relationship in a time sequence, but often our data do not allow for that). An indicator exhibiting only the effect of learning on ability would give a biased impression of this relationship.

Diagram III



Note: Diagram III shows the interdependency between educational growth and economic growth; economic growth influences the growth of the educational system by providing more resources for it; at the same time, however, more education is a factor behind the growth of the economy.

c) Even if recursive models or single-equation relationships are realistic, however, there will also be a large number of exogenous factors influencing the area in question apart from education. Only if no relationship exists between each of these and the educational variable can we hope to disentangle the influence of education. This is rarely the case. Often we have to cope with a high degree of multi-collinearity, which may make it impossible to estimate with any degree of certainty the effects of the educational system. It can be argued that if the inter-correlations between the variables are strong, we can use one variable to represent the combined effect of all the variables. This is feasible for forecasting purposes as long as we do not expect this inter-relationship to change and for social reporting in those instances where it is sufficient to present the combined influences of a set of variables. But if we want to know the sensitivity of the goal variables to any of the explanatory variables, the disentanglement of effects of each variable is crucial.

An additional problem arising out of these considerations is the following: if development within one goal area or with respect to a specific goal is not in the required direction, should we then draw the conclusion that educational policy has not been effective towards influencing this goal? In view of the theoretical relationships outlined above, this need not be so. Education might have had a strong and positive influence on the goal in question, but the combined effect of other factors might have been stronger and negative. Therefore, in the absence of the influence of education, the negative effect would have been much larger.

Within the framework outlined above we shall use the concepts of efficiency and productivity, and these need to be defined. These concepts have been inherited from economic theory and are closely related to the analytical tool called a production function. A production function describes, for a given technique of production, the relationship between the maximum output and the combination of inputs producing this output. The combination of inputs producing a maximum output is called an efficient combination. There are, in principle, many efficient combinations of inputs depending on different combinations of relative prices.

We need to distinguish between the concepts of productivity and efficiency. Assume for simplicity that output is produced by only one factor, then productivity is measured by $\frac{X}{Y}$ where X is output and Y the amount of input of this factor. There is nothing in this definition of productivity which necessarily implies anything about efficiency. If the output X is any output given Y, $\frac{X}{Y}$ is still a valid measure of productivity, but unless we know the maximum value of X given Y it is impossible to derive an exact measure of the degree of efficiency. Since the technique of production is changing over time, it is conceivable that even an activity which enjoys productivity increases over time might be conducted inefficiently. On the other hand, an activity which is conducted efficiently may not show productivity increases over time, if the rate of technical progress is small for this particular activity. Thus productivity and efficiency are different concepts and we cannot use one as a synonym for the other(1).

A basic question is then whether the concepts of efficiency and productivity can be used in the same way within the educational system as within economic theory. The first important problem arises when we try to define the product of the educational system. We shall distinguish between sub-product and total product. The sub-product refers to one of the goal-areas mentioned above. If we, for simplicity, assume that each goal-area is represented by only one indicator, then the sub-product of the educational system with respect to any of these goal areas will be that part of the value of this indicator which can be related to inputs within the educational system when all other factors have been accounted for. It is obvious that an indicator of product or performance will be a much cruder measure than the usual measure of

1) For a more detailed discussion on this point, see M. Blaug, "The Productivity of Universities", Economics of Education, Vol II, Penguin, 1969.

product in the economic sector. At the level of the one-product firm there are no problems of measurement at all, tons of margarine, tons of coal, etc. Even at the aggregated level, the use of prices as weights represents a clear-cut procedure as long as prices reflect the relative importance of the different goods as conceived by the market(1).

Indicators constructed within e.g. the national accounts system can therefore all be expressed in terms of money. The indicators we have to use in the educational field represent at best a surrogate measure of the ideal concept, and will be much less clear-cut and unequivocal than the measures in economics, since they have no common unit of value. In addition, the production process, as understood in economic theory, is for all practical purposes an exact and autonomous link between inputs and outputs. Within the educational system, inputs such as pupils' time, teachers' time, materials and buildings must be considered. However, these are inputs into a production process where the student himself is the producer of education. This at once means that a very important part of the educational process is determined by forces outside the educational system where the student's family background, motivation, ability and peer group influence are very important(2) i.e. factors other than strict technical relationships. It might happen, for example, that for any input into the education process, there is no result whatsoever, if the producer himself, namely the student, should choose not to educate himself. Perhaps more realistically, only a small amount of education will be realised, if the kind of education received by the pupil has no value within his set of preferences. Thus we cannot use the concept of productivity in the same way in systems where human beings are the essential elements in the production process as when industrial processes are concerned. In the educational process there might exist little or even no output whatever, due to exogenous factors, while this cannot happen within an industrial process.

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1) Note however that this is a difference of degree only. The observed prices are determined on the basis of a given income distribution which reflects the weights given to the preferences of different groups in society. The determination of these weights is, of course, an ethical and political problem.

2) In a discussion in the American Economic Review, "Papers and Proceedings", May, 1970, K. Arrow mentions the problems of communications between teacher and students as perhaps the main source of differences in the level of efficiency between schools.

The fact that the educational process has a very small degree of autonomy makes it difficult to assess the relation between inputs and performance. At the present stage of social science development, with a serious scarcity of relevant data, the best one can hope to achieve is some crude impression of the basic relationships. This in itself limits the value of the concepts of efficiency and productivity, there being very large errors in assessing them, even if the conceptual problems were solved.

The third problem, which is probably the most serious one, arises if one tries to assess the total product of education. This will mean an aggregation of the "product" for each of the goal areas mentioned. In the economic sector this is fairly simple. A simple aggregation over products is performed by using relative prices as weights and one arrives at the measure of GNP at the highest level of aggregation. A measure of total factor productivity can then be calculated. With regard to the multi-dimensional nature of the goals for the educational system, the weights will be determined by the political decision-making process. There is therefore no such thing as the productivity of a specific educational system as long as the idea that education is a multi-goal activity is accepted. Different people will give different weights to the different sub-goals, and for a given set of inputs there might be as many productivity measures as there are people. Therefore, a comparison of the productivity of, say, two educational systems with different goal-structures will be misleading(1). Only if the goal-structures are identical, i.e. if the weights given to the different goal areas are the same, can such a comparison be made.

There are thus three important differences which distinguish the production of education from production in the economic sense:

i) The conceptual and practical difficulties attached to the measurement of the product even if it can be defined.

ii) The small degree of autonomy of the educational process.

iii) Productivity measures of the educational product are completely subjective and meaningless without reference to the actual political decision process.

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1) This will also be true of two economies with widely different relative prices.

For these reasons too much should not be expected of productivity studies in education. However, such studies will be done and rightly so but one needs to be aware of all the possible pitfalls in order to reach a realistic assessment of the value of these studies.

In setting up relationships between the inputs into the educational system which the system can control, and the development of these indicators, it is possible, as discussed above, to measure the factor productivity with respect to any one of these goals. Sometimes people tend to distinguish between the internal and the external productivity of the system. By external productivity is presumably meant the above-mentioned productivity measures, i.e. between total factor inputs and goal indicators within the five areas specified above. In the same way, internal productivity seems to mean the total factor productivity of educational inputs with respect to some measure of the educational product at a stage within the system, e.g. achievement scores.

The concept of internal productivity would be meaningful if the system were a closed one, that is, if high achievement scores were an end in themselves. This, they clearly are not. Achievement scores are believed to be indicators of the impact on the individual made by the inputs the system employs, assuming that genetic and cultural factors are accounted for. The only raison d'être for this measure is that there is a connection between it and what might loosely be termed as the individual's "success" in life, which on the macro-level is described by the educational goals with respect to the five areas under discussion. In other words, the achievement scores act as a substitute for the proportion of an individual's earning power which can be attributed to education, how his demand for education is satisfied, his ability to operate in the social system, etc. The consequence is, therefore, that there is no such thing as internal productivity(1). Because we think or believe that achievement scores represent the performance of the educational system with respect to the goals set up for it, they may be related to the inputs of the educational system, and a measure of productivity obtained. As mentioned above, this is however a meaningful exercise only as long as we believe, or rather have empirical evidence, that there is a fairly close relation between achievement scores and the ultimate goals of the educational system. We should be surprised if this were so in all

1) The situation is complicated since achievement scores are often used by employers or institutions of further education as the entrance criterion so that they are (in the present system) an objective factor in the situation.

instances, for the performance of a system with a multi-dimensional goal structure cannot adequately be expressed by a one-dimensional measure as achievement scores. We believe therefore that only in some instances are achievement scores useful as indicators of educational performance with respect to the goals we have chosen. However these are the only indicators which have been proposed as direct measures and, lacking something better, they have been proposed in some connections either as indicators or statistics.

A main argument for concentrating the efforts on internal measures has been that, in order to measure the impact of education on society, a host of other factors must be taken into account which would at most give us a very crude picture of this impact. The fallacy of this argument lies in the identification of internal measures which are due to education alone or less related to societal influences than other dimensions of school output.

Another problem relating to internal measures is that we can never really assess whether education is relevant or not if we choose to rely on such measures alone. Only by observing how people behave in society, attempting to account for factors other than education as far as possible, can the relevancy of education be established.

Up to the present, what the educational system produces has been unknown but it seems likely that the basic goals and concerns of society will affect and be affected by what it produces. Thus the measurement of these concerns and the relationship between these measures and the input of the educational system is here considered. When the influence on these indicators of factors other than the educational inputs has been accounted for, as far as present techniques allow, then a measurement of the contribution to the product by the educational inputs within each of the goal-areas is possible. If agreement on the weights to be given to each of these indicators is reached, then a measure of total product can be obtained. If the total product is divided by a weighted average of educational inputs, a measure of productivity is obtained.

It might be useful to end this section with a discussion on a commonly used indicator of inefficiency (or efficiency) in the educational system, such as the drop-out rates. This is a very unreliable indicator of inefficiency because a selective school system can be made to appear "efficient" merely through excluding all those students who might drop out: yet there is a waste of the opposite kind, in so doing; those being excluded who would have completed school and profited from it.

A spurious "efficiency" can also be created by reducing standards so low that no one drops out(1). In general we should like to point out that the factors which constitute the appropriate courses for all the different individuals who present themselves for further education are unknown and that this should not be regarded as an inefficiency, but rather as a deficit in our knowledge. For example, even if the evidence available does show that extra years of study have a subsequent advantage in terms of increased income, this does not necessarily imply that those who voluntarily leave the system earlier would have benefited financially in the same way, had they remained.

Individuals who leave a particular course before completion may do so because:

i) They are unable to follow the course in terms of comprehension.
ii) The course is not exactly what they wanted or what they thought it to be when enrolling.
iii) They have social or economic reasons for leaving the system.
iv) They are transferring to another field or form of education.
v) They have absorbed all they wanted to know in the field of knowledge.

Only in the first two cases can a 'drop-out' rate be interpreted as an inefficiency or waste of resources in the system, in the third case this might be interpreted widely as an inefficiency in the social system. In the latter two instances, we have no reason to reproach the system. Without much more information on the reasons why people leave or complete courses, 'drop-outs' cannot be directly interpreted as indicating efficiency or inefficiency.

4. PROPOSED APPROACH TO THE CONSTRUCTION OF INDICATORS

In the following chapters we shall discuss each of the goal-areas we have mentioned above, and make precise statements on the different emphases that are possible inside each general goal-area. Then within

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1) This leads us to endorse the approach of IEA in their Mathematics Study of using the measure of 'how many are brought how far' as the best single indicator of 'efficiency'. See T. Husén, ed. International Study of Achievement in Mathematics, Vols. I and II, Wiley, New York, 1967.

each of these 'sub-areas' we shall discuss possible indicators and the assumptions required for their construction. In some cases there will be several theoretical models of the relationships between education and society which would lead us to develop different indicators. We have referred to and very briefly outlined the relevant theoretical controversies and the different indicators to which the different lines of argument would lead. But in such a situation we have concentrated on the raw data requirements directly, rather than the indicators, since the different schools of thought normally agree on which data are relevant, although not on what to do with them. In those cases where we can propose indicators we have shown what would be the policy implications of changes in them.

Chapter III

TRANSMISSION OF KNOWLEDGE AND SKILLS

Perhaps the original aim of mass education(1) was to ensure that all members of a society could participate as citizens. This could be interpreted either cynically, to mean that a minimum level of education was necessary to support the development of a capitalist economy or by ascribing a degree of altruism to the government of the day, to mean that the purpose of mass education was to give individuals the knowledge and skills which are a prerequisite of functioning in a complex social system.

We want to measure the number of persons having acquired the necessary knowledge and skills and the number of persons participating in the educational process. But in this context we shall concentrate our discussion on the measurement of knowledge and skills transmitted to each person during the educational process, since indicators based on the stock of people with certain levels of education or participating in the educational process have been discussed extensively elsewhere(2). We shall however return to some of these indicators when discussing equality of educational opportunity.

Individuals should be able to function more or less autonomously with respect to all the major institutions of society. Thus we require individuals to perform a variety of routine operations, participate politically, economically and socially, and we want them to be ready to handle to-morrow's problems.

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1) Distinguish from the aims of an élite education whose purpose was to train future governors, and therefore allowed only the privileged few to be educated.

2) Methods and Statistical Needs for Educational Planning, OECD, Paris, 1967.

1. "FUNCTIONAL" LITERACY

Achievement scores measuring factual knowledge represent one possible indicator of the amount of knowledge and skills transmitted to the individuals through the educational process. Examples of such achievement scores are those used by the National Assessment for Educational Progress in the United States(1) or the IEA study(2).

There are other skills necessary for an individual in a complex society such as ours: operating simple mechanical gadgets from switching on a radio to driving; orientation and organisation with respect to any desired state so that appropriate choices can be made, and so on.

However, the primary obstacle for an individual when attempting to handle this complex society is his initial comprehension of what is allowed or required in any situation. This has been called functional literacy. Many individuals pass through our educational institutions going through the motions of learning reading, writing and arithmetic, without being able to use these skills in their day-to-day functioning.

There are considerable definitional problems attached to an indicator of functional literacy, and special difficulties for comparisons over time and between countries. The essential purpose is to test capacity to function in a modern society, and provide an independent test of the quality and relevance of education in meeting present social needs. The actual measure need not encompass the concept in its entirety, but should have a close correlation with the most important dimensions of the concept. In the Swedish Report on Low Incomes(3), the concept of functional literacy was operationalised by the question: would you be able to write a formal complaint about a decision made by an official authority? One difficulty with such an indicator is that performance in the test does not depend entirely on formal education. Nevertheless, low performance in the test will point to the need for improvements in formal education.

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1) For a detailed description see Proceedings of the International Conference on Testing Problems, Educational Testing Service, New York, 1971.

2) See T. Husén, ed., International Study of Achievement in Mathematics, Vols. I and II, Wiley, New York, 1967.

3) Låginnkomstutredningen, Innenriksdepartementet, Stockholm, 1970.

2. POLITICAL PARTICIPATION

Development of interest in the political process, and willingness or desire to participate in a political system are very complex goals of the educational system - complex because it is difficult to agree and define precisely the desired goals: and also because ideally the political process of the larger society should permeate the educational process itself, in order to prepare pupils for subsequent political participation. In other words, early and continuous political training or participation is a prerequisite to a high level of political participation in later life.

There is a body of research findings in sociology which shows (with many qualifications) that it is the people of higher social status and greater education who are more likely to participate in the political process, at a variety of levels, than those of lower social status. Their participation typically consists of: voting levels: direct party membership; taking responsibility in local political organisations, etc. There are two factors at work here:

- Ways in which the educational system teaches people about the socio-economic structure and the political system of the country in which they live.
- Ways in which the educational system imparts skills, interest in public affairs, willingness to control one's own destiny, etc.(1).

This, however, seems a biased view of what should count as participation in the political process. It is true that we may want to take as a goal an open democratic political process in some ideal form, but the present political arrangements may be far from this ideal. Thus, although people with more education are more likely to be active participants in present political processes, this does not imply that education per se contributes to support for the idealised version of our political system(2). It is quite possible that the more educated people are the

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1) Political participation is inextricably bound up with other influences in socialisation - family, peer groups, mass media, and it would seem to be impossible to devise indicators of the contribution made by education to the exercise of these skills. This is a case where we have exploited the fact that the educational system is a social system in miniature (see below).

2) We are not denying that most "ideal" political systems will require a highly educated population.

more active participants because they are able to operate the system more easily (since to be articulate is an asset in present systems) and because they derive greater benefits.

The former approach would suggest that children should be taught the technical intricacies of parliamentary democracy; the latter, that children should understand the social, economic and political forces which partially control their destiny. Children should be able to make informed future decisions about how they are going to operate, whether within such a system or outside it (in order to change it). So the way in which the educational system teaches people about the socio-economic structures and the political institutions of the country should be examined. As far as knowledge about the social, economic and political systems and how they work is concerned, it should be possible to devise indicators which relate the extent of knowledge to the "inputs" of the educational system, e.g. prominence of this topic in the curriculum, number of hours spent on it. However, such indicators are unlikely to be fruitful.

A more promising approach would be to link education to actual political practice. Thus in theory the educational system imparts skills, interest in public affairs, and a willingness to control one's own destiny. But these are compatible only within the idealised version of our political system. In present political systems, with bureaucratic structures, skill in political practice and an interest in public affairs are channelled into controlling other people's destinies rather than one's own(1). So we have decided not to include indicators measuring the extent of present political participation by educational level and, instead, use the fact that the educational system is a social system in miniature to measure the ways in which it fosters such an ideal atmosphere.

As such, we choose to value arbitrarily "participation" of individuals in the socio-political system per se. Education presumably contributes to interest in the political process through the diffusion of shared ideals, and specifically democratic sentiments. Although we could measure the effects of political education as evidenced in adult life, we prefer a more immediate measure. Therefore we propose indicators derived from the educational institutions themselves.

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1) See A. Canfort, Authority and Delinquency, Sphere Books, 1970.

3. EXTENT OF REAL AND APPARENT CONTROL EXERCISED BY PUPILS

A sense of control over one's own immediate environment is now considered essential for the individual to have any strong commitment to the institution. We would measure this by analysis of the decision-taking procedures, comparison of the formal constitutions and questionnaires.

4. CONSUMER EFFICIENCY

By this we mean the ability of individuals to choose what to buy among a wide variety of available goods. Thus payments made by social services to the poorest sections of the population are often scaled in amount so that an efficient shopper could subsist; and one of the tactics of social workers with clients dependent on payments from the State is to educate them in budgeting their daily expenditure.

Simple lack of market information is often mentioned as an explanation of why people pay different prices for the same goods. The less information that exists the more likely people are to pay higher than equilibrium prices. Recent evidence suggests that the amount of market information available and the use made of it are related to the educational level of the consumer(1). We should not necessarily take this too seriously because, of course, different social groups have differential access to restricted markets.

One indicator might be the fact that schools provide information on how to use the market through classes in home economics. In this case the indicator will be:

- Amount of time spent on home economics subjects by level of instruction and sex

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1) Education and income are strongly correlated in these studies, and the separate efforts are not shown. The availability and use of more information may therefore just as well be due to more income as to more education.

In some countries Consumer Associations provide information on the quality, quantity and prices of different goods. Membership of these organisations is clearly biased towards persons with more than average education. This suggests the following indicator:

- Membership in Consumer Associations by level of education, other factors accounted for

5. SOCIAL RELATIONSHIPS

Human contact has become more widespread and varied in modern societies. It would seem important for the smooth functioning of society that interpersonal relationships are possible between all social categories. We shall consider the three major examples of social divisions and the problems posed by communications across them, i.e. age, sex and social class.

a) Schooling in its traditional form is the counterpart of the European-based institutions of childhood. The separation of the infant role is a relatively recent innovation and is confined to westernised societies. Childhood has brought vital protections to children - many of which should be extended to adults. But the possible dangers of too great a separation of the worlds of young and old are well-known - the generation-gap, etc. Perhaps an over-concentration on age-specific attendance is not a universal benefit and the incorporation of adults into the educational system could serve a major purpose of re-integrating age groups. We have proposed in Chapter VII the collection of data on adult participation in education and so all we need do is to recommend again its use as an indicator.

b) Societies have become concerned in this century about the female role in the social system. The process of "emancipation" is likely to continue and the place of women in the home and at work is likely to be a major issue in the next decades. It seems possible, therefore, that educational systems will become more concerned with equality of boys and girls inside the school system.

It is, obviously, difficult to legislate against discrimination between sexes during the educational process. It has already (under the heading of "Equality of Educational Opportunity", Chapter V) been proposed that school systems should consider sex as a dimension of opportunity. It follows that ways in which a school system would specifically encourage the equal treatment of boys and girls should be considered.

In some school systems there are different options available for boys and girls, e.g. boys can practise woodwork, girls are taught how to sew. We see in general that the extent to which the school system insists on differential treatment of boys and girls is commensurate with its view of the appropriate sex roles. A possible indicator may therefore be:

- Proportion of school time at each grade level during which children are separated by sex

e) Evidence is divided as to whether the process of industrialisation has increased contact between social classes as service institutions become more widely available, or whether the policies of exclusion followed by the upper social classes have remained the same. The contact during compulsory schooling is probably a major influence on later peer-group contacts. As such it is important to know the degree of heterogeneity inside the school classroom(1).

We propose, therefore, that information be collected on dispersion of social class background in the classroom. A possible indicator might be the mean dispersion of social class background by type of school and region.

6. TO-MORROW'S CITIZENS

Education prepares the nation's youth for the problems of to-morrow. We do not know how this should be done, but we can make general points about minimum requirements for survival in a rapidly changing world. The following are therefore more than usually tentative.

a) Sex Education - Population Control

The world population has tripled in the past 100 years and population control has come to be appreciated as a serious social problem with world-wide implications. Certain areas of the world continue to fail to produce enough food to feed their growing populations, whilst other countries are managing to control the supply of food and the demand of

1) This could be made more general; thus we may want to include the range of ages in a given teaching situation as an important element in socialisation.

mouths. The present proliferation of studies is confusing; some are very alarmist and predict a world-wide famine before the turn of the century; others say that even with present technology we could, with better organisation, feed many more mouths. But even the latter view admits that there is a problem - in that we have to create special organisations to distribute the world's resources. The educational system must be the major means of propagating such beliefs. For example, in Kenya(1) it has been shown that education is a necessary prerequisite for the appropriate use of birth control devices.

b) The Ecology of Human Societies

We want to make a general claim that education should be directed away from simple cause-effect models of the world, towards an emphasis on the simultaneity of most complex processes. There may be objections about the extent to which we can expect to teach such intricacy to young children but, if this is the case, it seems to throw doubt on the inability of our present attempts to manage (and even foster) these same complex processes. Moreover, it would seem important that, for future generations, the balance of knowledge should be restored a little to include some feeling for the relationships between man and nature. After all, they have to survive the results of our havoc.

Destruction of human environment has become a major social and political issue in the second half of the twentieth century. Recent campaigns about pollution have attracted much attention. However we are not yet beginning to translate the observed macro-interdependencies between parts of our environment into prescriptions for individual compartments. Education itself requires an orientation towards the subtle balance of our environment, and an appreciation of the likely effects of any life style.

As a simple approach, we suggest that education should be partly concerned with instilling an appreciation of natural beauty and, as such, the amount of time spent on nature studies outside would be useful information. Whether there is any easy way to educate for caution, and how it could be measured is more difficult(2)

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1) H. Thias, M. Carnoy, Cost-Benefit Analysis in Education: A Case-Study on Kenya, International Bank for Reconstruction and Development, Report No. EC-173, 1969.

2) Perhaps the introduction of complex games which require consideration of many types of consequences rather than a stress on competitive team games would be the right approach, but this is guesswork, not belief.

We conclude this chapter by recapitulating the indicators and statistics proposed:

a) Achievement scores measuring factual knowledge by age, sex, number of years and type of schools, and relevant social characteristics.
b) Functional literacy, by sex and age.
c) Extent of real and apparent control exercised by pupils.
d) Amount of time spent on home economics subjects by level of instruction and sex.
e) Membership in Consumer Associations by level of education, other factors accounted for.
f) Adult participation in education.
g) Proportion of school time at each grade level during which children are separated by sex.
h) Mean dispersion of social class background by type of school and region.

The raw data requirements may be summarised as follows:
- distribution of school time by educational purpose, and of students by achievement scores, age, and social class of origin. Data surveys of functional literacy.

Chapter IV

EDUCATION AND THE ECONOMY

Industrial societies place considerable emphasis on the contribution which education is able to make to economic development. Within this general area and in order to facilitate the discussion, we shall suggest a division into two subsidiary areas:

1. Contribution to economic growth.
2. Efficient allocation of educated labour.

There is not always a need to distinguish between areas 1 and 2. Instruments which contribute to a more efficient allocation of labour may also enhance economic growth. But in our case it is useful to analyse separately the general relationship between education and economic growth in isolation from the more micro-oriented problem of how to allocate resources to different educations, e.g. efficient allocation of educated labour. There are also instances in which economic growth and a narrow view of efficient allocation of labour may conflict.

These goal areas constitute a one-sided view of the goals of education. No educational policy can go all the way towards fulfilment of everyone's economic goals since often there is a clear conflict between such goals and other goals discussed in this paper. We are however forced to discuss our chosen indicators in this chapter as if they represented the only goals for the educational system, since the apparent conflicts cannot be resolved at this level. Thus, when later in this chapter we use such concepts as efficient allocation, relative scarcities of labour, etc., we refer to the economic goal areas seen in isolation from the other goal areas of the educational system. It might well happen that, when all the other goals are taken into account, a particular allocation of labour, deemed efficient in economic terms, may not be the most desirable overall. The weights which should be attached to the different indicators in reaching a decision is a task for the political process - the present task is to provide the information necessary for a sound judgment on priorities, and as far as possible to point to possible goal conflicts.

As argued in Chapter II, we shall distinguish between measures having normative significance - i.e. indicators - and measures not having such significance, i.e. social statistics. Some of our proposed measures will clearly be statistics, which we have included because they measure aspects of the relationship between the educational system and the economy and which are necessary for our understanding of the relationships between these two systems.

The relationships between the educational system and the economy are at present surrounded by scientific controversy. This is not the place to decide in favour of one school or another but, as far as possible, attempt only to propose measures which reflect the different assumptions or beliefs concerning these relationships.

1. THE CONTRIBUTION OF EDUCATION TO ECONOMIC GROWTH

a) Production Function and National Income Accounting Analyses

Economists have for some time analysed the relationship between education and GNP in terms of national income accounting models and aggregate production functions(1). It might be tempting to use these methods to arrive at an indicator at the global level measuring the overall contribution of the educational system to economic growth. We have, however, rejected such an indicator on several grounds.

First, as pointed out by Z. Griliches(2) and M.J. Bowman(3) in the case of national-income accounting, the methodologies give us no independent test of the aggregative effects of education upon growth in national income. Second, as Professor Bowman shows, the proportion of total growth

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1) E.F. Denison, The Sources of Economic Growth and the Alternatives Before Us, CED, New York, 1962, Why Growth Rates Differ, Brookings Institution, Washington, 1967. "Some Major Issues in Productivity Analysis", Survey of Current Business, May, 1969; D. Jorgenson and Z. Griliches, "The Explanation of Productivity Change", Review of Economic Studies, 1967; Z. Griliches, "Production Functions in Manufacturing: Some Preliminary Results", The Theory and Empirical Analysis of Production, NBER, New York, 1967; "Notes on the Role of Education in Production Functions and Growth Accounting", in Education, Income and Human Capital, NBER, New York, 1970.

2) Z. Griliches, "Notes on the Role of Education in Production Functions and Growth Accounting", NBER Conference on Research on Income and Wealth, Madison, Wisconsin, November, 1968.

3) M.J. Bowman, "Education and Economic Growth" in Economic Factors Affecting the Financing of Education, 1971.

"explained" by education is a function both of how much education directly contributes and the overall rate of growth. Thus, according to Denison(1), although the United Kingdom had the lowest overall rate of growth in the period 1950-1962 among the countries considered, education had a high relative position, precisely because the overall rate of growth was low. A third difficulty is that the contribution of education to economic growth is partly determined by the share of wages in national income. Since this share is relatively high, i.e. 60 per cent, the contribution of education to economic growth is bound to be high. Fourthly, the results are very sensitive to the way in which the inputs are actually measured, and therefore there is much disagreement between scholars as to how large the contribution of education really is. Finally, there is the well-known problem that national income or GNP as usually measured are very crude measures of real production and very deficient if what we want to measure is the growth in social welfare(2).

The most important weakness attached to all these studies is that, even if all the qualifications made about them were not valid, the significance of these findings for educational policy would not go beyond the statement that: education contributes to economic growth. Thus, the relevance of these studies for practical policy-making is low.

However, if we accept such studies as providing us with some useful data, then we can furnish an independent test of the aggregated impact of education on economic growth, provided one accepts the theoretical framework by measurement in terms of aggregate production functions. But serious doubts have been expressed about the existence of aggregate production functions. F. Fisher has shown that, with constant returns to scale and only two factors of production, the necessary condition for aggregation is that all capital is perfectly substitutable and all technical changes are capital augmenting(3). In fact, it is possible to argue that: "the aggregate production function does not have a conceptual reality of its own; it emerges as a consequence of the growth processes at various micro-economic levels and is not a causal determinant of the growth path of an economy"(4).

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1) E.F. Denison, Why Growth Rates Differ, op. cit.

2) J. Mishan, The Costs of Economic Growth, Staples Press, London, 1967.

3) F. Fisher, "The Existence of Aggregate Production Functions", Econometrica, 1969.

4) I. Nadiri, "Some Approaches to the Theory and Measurement of Total Factor Productivity: a Survey", Journal of Economic Literature, December, 1970.

This does not rule out, however, production studies with education as a specified variable on a much less aggregated level. Griliches' studies of United States Agriculture(1) and Manufacturing are examples of this, even if the level of aggregation is still very high. What we need is a series of studies of the relationship between education and production on a disaggregated level, in order to reach a deeper understanding of how education influences economic growth. A major effort is therefore required to provide the necessary data for such an analysis to be possible. Such studies can provide measures of the contribution of education to production within industries at a disaggregated level(2).

These are not the only possible measures of the relationship between education and growth. Recent work has stressed the dynamics of growth(3) in arguing that a most important aspect of technological advance is that education enhances innovational ability. Some theoretical implications have been worked out by Nelson and Phelps (1966)(4), and the theory has been tested on data from Indian and United States agriculture by Chaudri (1968)(5) and Finis Welch (1970)(6). The important distinction here is between what is called (a) the worker effect and (b) the allocation effect.

The worker effect is defined as the marginal product of education, i.e. the increase in output per unit change in the input of education, all other factors remaining constant. Yet, this is clearly not all education can do. Increased education may influence the allocative ability of the worker, i.e. his ability to decode and use information about other inputs. This may lead to the use of techniques and inputs which would otherwise not be used, and thus to an increased efficiency in production.

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1) "Estimates of the Aggregate Agricultural Production Function from Cross-Sectional Data", Journal of Farm Economics, 1963.

2) We do not as yet know which level of disaggregation is really necessary for reaching satisfactory results; we have therefore left the question open.

3) Expression due to M.J. Bowman, op. cit.

4) R.R. Nelson and E.S. Phelps: "Investment in Humans, Technological Diffusion and Economic Growth", American Economic Review, 1966.

5) D.P. Chaudri, "Education and Agricultural Productivity in India", Ph.D. dissertation, University of Delhi, 1968.

6) F. Welch, "Education in Production", Journal of Political Economy, January, 1970.

The problem is to find out whether education in general influences the allocative ability, or whether only specific types of education have this feature and how strong the effect is. In his study, Welch managed to show that college education in general, within United States agriculture, influences the allocative ability of the farmers. This was done by studying the relative earnings of different types of education hypothesizing that earnings reflected marginal productivities of labour.

These results do not provide us with a basis for indicators or statistics. Nevertheless, the a priori reasons for believing that education enhances the allocative ability are very strong and, on this basis, we shall suggest the importance of research into:

- The allocative ability of different types of education, shown by the effect of R & D and new inputs on marginal productivity as measured by earnings

In addition to micro indicators, there is a need for a summary statistic which can provide a rough picture of how education influences growth and development in general. We have rejected the aggregate production function, but the theory of international trade may provide a basis for a summary measure. The Heckscher Ohlin theorem argues that, if there is a free flow of trade between countries, there is a tendency towards equalisation of factor prices. In traditional models of this type there are only two reasons for differences in income per capita between countries: differences in labour force participation rates and differences in overall capital-labour ratios. But if we accept the concept of investment in man, two additional causes for income differences are introduced: differences between countries in the stocks of educated labour and differences in the innate ability of labour(1). This theory can also be applied to regions within one country.

Only a limited amount of empirical research has been done in this field, but the few results which exist support the theory strongly. Work by Anne O. Krueger(2) highlights the importance of human capital in explaining income differences between countries. For 16 of the 21 countries studied, more than 50 per cent of the income difference between any country

1) P.B. Kenen and R. Lawrence (eds.), The Open Economy: Essays on International Trade and Finance, New York, 1968.

2) A.O. Krueger, "Factor Endowments and Per Capita Income Differences among Countries", Economic Journal, September, 1968.

and the United States can be explained by different amounts of human capital. In eight of these cases more than 60 per cent of the income difference was due to differences in human capital. Similar studies have been done for the states in the United States, which in general confirm the basic consequences of the theory(1)(2).

As a global indicator of education's contribution to economic development, we may therefore suggest:

- The proportion of the difference in income per capita in country i and a reference country which can be explained by their differences in human capital

If we accept that these cross-section results have growth implications, they will imply that the higher the proportion of the income differences which can be explained by differences in human capital, the more important will be the contribution of human capital to further economic development.

An indicator such as this can also be used to assess the possibility of employing human capital investment for equalising income between regions. We therefore propose the same indicator for regions within one country. More research is required, however, before the validity of this indicator can be established.

b) Indicators of the Quality of the Labour Force

The indicators we have proposed have been measures of the actual contribution of education to growth and development. Moreover, they are only potentially useful, for their validity cannot be established until much more research has been done, so that their inclusion in this paper must be seen more as a suggestion for further research than as a proposal to Member countries.

More useful perhaps, and, in some instances, more readily available, are indicators which measure the production potential of the labour force without considering the operations of the economy per se. How this potential is utilised is not a "responsibility" of the educational system. If we want aggregate measures of the productive potential of the labour force, we can propose four operationally different indicators.

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1) See for example G.W. Scully, "Interstate Wage-Differentials: A Cross-section Analysis", American Economic Review, December, 1969.

2) F. Welch, "Linear Synthesis of Skill Distributions", Journal of Human Resources, Summer 1969.

1) The first and simplest would be the average level of education in standard school years, say 1950 school-years, of the population between 15 years and 65 years of age.

2) The second which is comparable to current measure of the stock of physical capital is a measure of the stock of human capital in terms of production costs (institutional costs and income foregone for each type of education to-day).

3) The third is based on the capitalisation of wage differentials over and above the returns to uneducated labour on the assumption that wages measure the marginal productivity of labour. In order to use this indicator, an agreement must also have been reached on which discount rate to use in the capitalisation procedure(1)(2).

4) The fourth indicator (which has been proposed by Bowles)(3) measures the average number of efficiency units of labour per worker, on the basis of two assumptions: relative wages of labour measures the marginal productivity of labour, and the elasticity of substitution between different kinds of educated labour is greater than zero(4).

It was stated above that, even though the indicators are in general not operationally equivalent, and that at least numbers three and four are theoretically more sophisticated than numbers one and two, in actual practice we may not be able to discriminate between them statistically on the basis of data.

The policy information provided by these indicators is more detailed than when provided by production functions, since they also measure the relative importance of each type of education for the production potential of the labour force.

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1) For a detailed discussion of various measures see M.J. Bowman, "Human Capital: Concepts and Measures" in The Economics of Higher Education, Office of Education, Washington, D.C., 1962.

2) The second and third measures would be operationally equivalent if all rates of return to different levels of schooling were similar and equal to the rate of discount. See Z. Griliches, "Notes on the Role of Education in Production Functions and Growth Accounting", op. cit.

3) Planning Education System for Economic Growth, Harvard, 1969.

4) If the elasticity of substitution is infinite, we arrive at the same index of labour quality as proposed by Denison, i.e. labour input weighted by relative wages.

The raw data needed for all these four indicators taken together is: number of people in the labour force by education, age, and sex: earnings (or wages), by education, age and sex: costs (direct and income foregone) for each educational career.

2. EFFICIENT ALLOCATION OF EDUCATED LABOUR

a) Internal Rates of Return and Cost-Benefit Ratios for Different Levels of Schooling and Different Types of Education at each Level of Schooling(1)(2)

There is probably no issue within the field of educational planning that has aroused as much controversy as the use of social rates of return(3) as a basis for policy decisions. The word "social" implies that one wants to measure the economic benefits of education to society. Some reject it altogether, pointing out that the assumptions required for appropriate use of rates of return are very strong (see below), while some proponents go to the other extreme, arguing that rates of return are the indicators for measuring the economic effects of education on society.

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1) The most important work is: G. Becker, Human Capital, NBER, New York, 1964.

2) For an excellent and detailed discussion on the measurement of rates of return, see M. Blaug, "The Rate of Return to Investment in Education", Economic Journal, 1965, and An Introduction to the Economics of Education, Chapter 7, London, 1970.

3) Let R_t be the annual increments in earnings due to further education, before deduction for taxes, and C_t the annual costs of this education, of which the most important are the direct costs by educational institutions and earnings foregone by the student. Then the social rate of return r is determined by

$$\sum_{t=1}^{n} \frac{(R_t - C_t)}{(1 + r)^t} = 0$$

where n is the last year the individual spends in the labour force. C_t will be positive during the period of training, zero during the rest of the period 1 ..... n. Data on R_t are obtained from cross-sections of individuals or groups of individuals at the same level of education but belonging to different age-groups net of influence of other factors such as intelligence, parents' income, education and social class, etc. Thus, we assume that this cross-section profile provides us with an estimate of an individual's life income profile. Since earnings grow over time, the cross-section profile will underestimate life-time earnings of the average individual, but this can be accounted for by multiplying average earnings in each age group by a growth factor.

Provided the assumptions on which the use of rates of return are based are sufficiently realistic, it cannot be denied that they will provide more information than alternative measures, while at the same time being fairly easy to construct. What is needed, in fact, is a representative sample of earnings by age, sex and education and estimates of institutional costs for each educational career(1).

The problem is that neither case can be fully established until further evidence is forthcoming. There is no use in arguing on beliefs only that the basic assumptions of the approach (see below) are so unrealistic (or the contrary) as to invalidate or support it. Nothing is better than empirical evidence and the rate of return analysis is excellently suited as a framework within which to support or refute the basic assumptions underlying its use.

Simplifications are necessary to establish workable models; the question is whether the assumptions we have to make in constructing particular models are so unrealistic that we are left with less relevant information than could have been obtained intuitively.

In order for the rate of return analysis to be used as criteria for investment decisions and indicators of allocation of educated labour, three assumptions are made:

1) Educational attainment influences earnings.
2) Earnings reflect marginal productivity of labour.
3) Labour markets must be sufficiently flexible so that identical workers are paid the same wage.

According to M. Blaug(2). the most important criticisms against the approach may be said to be:

i) Innate ability, motivation, social class, etc, are so entangled with educational achievement that the pure effect of education on earnings cannot be satisfactorily separated.

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1) Note that once we have collected these wage data we also have information on income foregone.

2) M. Blaug, op. cit.

ii) Earnings for people do not reflect their productive power, but are determined by social conventions, trades unions policies, etc., in short, the labour market allocation mechanism is so imperfect as to invalidate assumptions 1 and 2.

iii) The direct economic benefits of education constitute only a part of the important total benefits from education, and the latter is not taken into account in an analysis of this type.

The third argument is answered in this paper by the fact that we consider other goals. It is not a criticism of the use of rate of return as such, but an argument against regarding the purpose of the educational system as primarily economic. We have accepted this by making the rate of return one of the many indicators to be taken into account by the political decision-makers. In addition, the first argument against that approach tends to be refuted by available evidence(1). While it is obvious that age-earning profiles as such overstate the impact of education on earnings, there is no question that the measured impact is considerable, even allowing for a host of other factors which it is possible to measure statistically. Denison in his study of United States growth assumed that two-thirds of the differences in earnings could be attributed to education. The correct size of the correction factor is however very uncertain and depends on the circumstances. The effect of multi-collinearity probably overcorrects for other factors particularly because ability and learning are not independent of each other(2).

The fact that education really contributes to earning differences is not however direct evidence that education contributes to the productive capacity of people. For example, one can argue that education re-distributes income, and that the extent of re-distribution is a function of the level of education. Another theory is that earnings are a function of the level of education, not because education as such

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1) D. Wolfle and I. Smith, "The Occupational Value of Education for Superior High-School Graduates", Journal of Higher Education, 1956;

G. Becker, Human Capital, 1964;

I. N. Morgan and M. H. David, "Education and Income", Quarterly Journal of Economics, 1963;

T. Husén, Ability, Opportunity and Career, Almquist and Wicksell, Stockholm, 1968.

2) Z. Griliches, op.cit.

contributes to the productive power of the individual, but that firms in a risky world (where information is a scarce resource) use educational certificates as a proxy for general ability.

The proponents of the rate of return approach however base their arguments on the marginal productivity hypothesis, according to which earnings reflect marginal productivities of labour. Differences in earnings therefore reflect different productive capacities. Now this hypothesis can hardly be tested directly(1)(2), i.e. by making a direct test of the link between marginal productivity and wages. What we can do, however, is to work out and test the consequences of this assumption. There exists some empirical evidence which supports this hypothesis(3) for some types of educated labour but on the whole the evidence is inconclusive. More labour-market research and sensitivity analysis is required to clarify in which markets the assumptions hold true and in which they become invalid. The existence of the trades unions' needs must be taken into account in such an analysis(4).

If we then, for the sake of argument, accept the rate of return approach, we can give the condition for an efficient allocation of educated labour: The social rate of return to all types of education should be equal(5).

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1) See R. Lester, "Shortcomings of Marginal Analysis for Wage-Employment Problems", American Economic Review, 1946.

2) F. Machlup, "Marginal Analysis and Empirical Research", American Economic Review, 1946.

3) D.M. Blank and G.J. Stigler, Demand and Supply of Scientific Personnel, NBER, New York. 1957.

4) A priori it might be expected that trades unions do not have much influence on rates of return to education, since the level of education of their own members is fairly low. In countries where the power of trades unions to influence wages has been analysed it has been argued that this power is fairly weak. See H. Gregg Lewis, Unionism and Relative Wages in the United States: An Empirical Enquiry, Chicago University Press, 1963.

5) If we want to go further and require efficient allocation in all markets, we shall require that private rates of return be equal to social rates of return which, in turn, must be equal to rates of return on other investments (See Chapter VI).

In view of the imperfections in the market, and the fact that this rule is based on marginal changes, it must be regarded only as a guideline to establish relative priorities of educational investments. Estimated rates of return reflect *ex post* allocations which indicate the direction of investments, but do not indicate the absolute amount needed. This calls for frequent collection of data needed for estimation of rates of return on an annual basis. However, to concentrate too much on maximising the efficiency of the labour market at any instant of time is misleading, particularly because the rule does not necessarily ensure efficient allocation over time(1). Contrary to competitive market assumptions, information is a scarce good and markets need time to adapt to new situations. Low earnings for relatively new types of education may reflect uncertainty as to their utilisation, more than their basic long-term productivity. In that case, low rates of return do not signal reduced investment in these types of education.

Some additional technical problems should be mentioned. Internal rates of return, which are the usual measures of rates of return, are in general inappropriate as guidelines for allocation within a given educational budget. In this case, theory indicates that benefit-cost ratios based on the present value criterion should be used as guidelines. The problem is however that, in this case, a rate of discount must be estimated separately to compute the benefit-cost ratios - a highly controversial problem(2). However it can be done, and where an actual rate of discount is used to evaluate public investments, it can also be used to evaluate educational investments(3).

If we extend, however, the concept of efficiency not only to include "equality between rates of return for different types of educated labour", but also "equality between the returns to education and other types of investment", internal rates of return will be appropriate, since then we are not operating within a given budget. However, the basis for such comparison is highly controversial.

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1) See R. Dorfman, R. Samuelson and R. Solow, Linear Programming and Economic Analysis - Chapter XII, The Rand Corporation, 1958.

2) See W.J. Baumol, "The Social Rate of Discount", American Economic Review, 1968 and the discussion following, American Economic Review, 1969.

3) Cost-benefit ratios have been estimated for different educational careers by C. Selby-Smith, The Costs of Further Education, Pergamon Press, 1970. This book also includes a discussion of benefit-cost ratios versus internal rates of return.

The use of internal rates of return assumes that a period of investment i.e. schooling, is followed by a period of income generation due to this investment. This may not be so for many reasons, for example, with a system of recurrent education there may be more than one period of investment. In that case, internal rates of return might yield solutions which in economic terms are meaningless. The appropriate criterion for investment is then again the present value criterion(1). In order to calculate internal rates of return, one is forced to use cross-sectional data for people in different age groups. Even taking into consideration that income will grow over time, this introduces a considerable degree of uncertainty into the analysis.

To conclude this chapter, we stress the need for more research to establish whether internal rates of return are sensible indicators of efficient allocation of educated labour. To do this, we need statistics of earnings which can be combined with educational background and age, and estimates of institutional costs. Analyses must be undertaken to assess the impact of market imperfections. Even if evidence so far seems to give some support to the rate of return approach, the most important feature is that the assumptions underlying the use of the internal rates of return can be refuted on the basis of empirical evidence.

The policy information obtained from social rates of return are guidelines for establishing relative priorities for educational investments. Investments should be increased where the social rates of return are higher than the average, and reduced where the social rates of return are lower than the average, so as to reach a situation where the social rates of return are equal for all types of education. Rates of return can also be used as a basis for establishing priorities between education and other sectors of society. This involves however many difficult problems, which we shall not be able to discuss in this context.

b) Variance of Earnings by Education and Occupation

For people with identical backgrounds and identical innate ability and education, levels of earnings should be the same, if people are paid according to their marginal productivity. If we relax the assumption

1) Note that this may be a marginal problem since it requires that earnings are negative during the period of recurrent education.

about background and ability, we shall observe a dispersion in earnings for people with identical education(1). But if we relax the assumption that earnings of people reflect their marginal productivity, variance of earnings should increase considerably. In other words efficient allocation of labour implies a "small" variance of earnings for a given type of education, while inefficient allocation implies a "large" variance of earnings. This is admittedly a weak measure, but as a statistic it will be useful as additional information. Thus our measure will be: variance of earnings by education. An additional measure of inefficiency would be the proportion of the variance of earnings which is due to occupational differences. If educated labour is efficiently allocated, this proportion should be small.

Another measure of efficiency is one which utilises only a necessary condition for efficient allocation of labour, i.e. that educational careers with high total costs command higher earnings than careers with lower total costs. A useful statistic may therefore be to compare the ranking of educational careers according to total costs, with a ranking according to average expected life-time incomes, or average earnings for a given age group. A rank correlative coefficient lower than 1 would indicate inefficiencies, but more information would be needed to pinpoint which particular educations were inefficient.

c) Unemployment and Shortage (Vacancies) of Labour According to Educational Background and Occupation

In an economy with fixed or inflexible prices, rates of return are not good indicators of efficient allocation of labour. We shall have to resort to other measures. With survey methods, unemployment of qualified personnel can be detected by using the indicator:

- Proportion of unemployed by education, age and occupation

Large scale unemployment among groups of people having a certain educational background can, in principle, be traced to three possible causes:

i) A certain educational path has become obsolescent and that part of the educational system responsible for retraining people is not functioning effectively.

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1) Note that even if there is a perfect fit between total benefits from work and marginal productivity, there will still exist a certain dispersion of earnings due to differences in non-pecuniary benefits.

ii) Temporary unemployment has developed because supply has grown faster than demand at existing prices.

In these two cases, either the information feedback process from the labour-market to the educational system has not been very efficient or the measures used within the educational system to slow down the supply of new graduates have not been very effective. In that case, the educational system is not very efficient with respect to our goal. It might happen, however, that this situation will still occur even if there has been an appropriate reaction, especially in cases where the system is dimensioned on the basis of aggregate private demand, where the only instrument available to authorities has been a feedback of information to the public. Then, of course, students might still want to pursue a certain educational path even if it were probable that they would be without work for some time. We might distinguish between these two cases by distributing the unemployed by age-groups. If unemployment is found to be more heavily concentrated in the older age-groups, then the problem may be obsolescence, if unemployment is concentrated in lower age-groups, then it is probably a temporary excess of supply over demand in the market(1).

iii) The third situation arises when there is a general recession. A certain amount of unemployment then exists but it will not, of course, have any relationship to the management of the educational system. The degree of unemployment will, however, be related to the average level of education within the different occupations. Thus, allowing for the influence of other factors, the difference in the level of employment which can be attributed to a high level of education is a useful indicator, especially in considering the benefits of recurrent education, on-the-job training, etc.

Another economic problem related to unemployment is the shortage of different types of educational backgrounds. Shortage by its very nature, is much more difficult to detect than unemployment. In a market where

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1) Note however that in India, which has had a surplus of graduates for many years, unemployment is concentrated at the lower age-groups because most graduates get a job eventually and remain in it.

the allocation mechanism depends on prices and wages, a shortage would manifest itself through rising wages, which will lead to a substitution towards other educational qualifications and the relative wages will return to their equilibrium position. There is some evidence(1) that for many educational qualifications the elasticity of substitution is so high that only a small movement in wages will lead to re-allocation of labour. In a market where the price mechanism does not function, a shortage would be extremely difficult to detect until it reached very large proportions, so at present it is not possible to suggest that we can measure shortage (in such a market by any indicators other than vacancies).

d) The Distribution of New Graduates by Educational Background and Occupation

This statistic is a measure of how the economy is using educated labour. It is a statistic since, in general, it is difficult to attach any normative value to it and is primarily of interest in a situation where there is no information on wages, costs and rates of return. Similarly, if one suspects that the wages generated in the market do not reflect the shadow prices of different types of educated labour. An example will show how this statistic might be used: if one found that a large number of the new engineering graduates were going into clerical work, this could be a measure of a mal-allocation of educational resources, and could suggest that the supply of engineers should be decreased while action should be taken to increase the supply of people with educational backgrounds more suitable for clerical work.

e) & f) The Rate of Migration and the Distribution of the Labour Force by Educational Background compared with the Level of Economic Development

These statistics are of the same nature as the ones we have already discussed. Extensive migration of people with certain educational qualifications suggests that, at the existing wage and price levels, there is perhaps a wastage of resources by the educational system. Recent analysis(2) has shown however that it is very difficult to state whether migration is good or bad. The measures proposed are therefore statistics.

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1) S. Bowles, op. cit.

2) A. Scott, "The Brain Drain - Is a Human Capital Approach Justified?" in Education, Income and Human Capital, NBER, New York, 1970.

In a poor country, migration might be a problem of concern to the authorities, but in a more affluent country where the dimensioning of the educational system might primarily be based on aggregate private demand for education, the attitude probably taken will be that certain kinds of human capital may have to be used internationally. Medical doctors, for example, have qualifications of this kind. Still, it is probable that if a large part of those with special qualifications go abroad, this could signal the need for change in educational policies. Therefore statistics of this type are of interest.

It has been argued that, as the economy develops, educated labour of different types is required in more or less fixed proportions per unit of output(1). In that case, one cannot rely on the market to allocate or signal the need for a different allocation of educational resources. Therefore one needs an indicator to show how to expand the educational system with respect to the manpower needs. For this purpose indicator 2(f) can be used, although with considerable caution(2).

As has been argued elsewhere(3), there are serious limitations to this approach but, used in combination with some of the other indicators described above, it can be useful. For example, if the educational plans of a developing country show that its future supply of medical doctors will be similar to that of a country of comparable size but far ahead in economic development, this argument would suggest that this number of doctors would not be forthcoming or efficiently employed. Either the system would not be likely to produce all the graduates due to lack of resources, or a large part of the doctors would probably migrate due to unemployment or very low incomes.

g) The Amount of On-the-Job Training(4)

A large part of what might be termed education is not taking place within formal, full-time educational systems. Much education, frequently in combination with investment programmes, is taking place in firms and is usually termed on-the-job training. Since the formal educational system

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1) Forecasting Manpower Needs for the Age of Science, OECD, Paris, 1960.

2) We are in doubt whether this measure should be named indicator or statistic, since in most situations it would only represent an important piece of information to the policy-maker without any normative content.

3) See for example M. Blaug, An Introduction to the Economics of Education, London, 1970.

4) G. Becker, Human Capital, 1964;
J. Mincer, "On-the-Job Training: Costs, Returns, and Implications", Journal of Political Economy October, 1962.

does not have the capacity and/or flexibility to provide the detailed knowledge necessary for adapting to changing economic conditions and for changing modes of production, the amount of on-the-job training is a measure of the additional training needed from an economic point of view. This is a very difficult statistic(1) to measure precisely. An estimation of resource-input is usually impossible, since, as already mentioned, much on-the-job training takes place in connection with investment programmes, and thus the cost of training is impossible to distinguish from the investment programme in general. Still, the number of people taking part in such training, and the average number of hours of training broken down by industry and occupation should provide us with a useful piece of information.

In a competitive market with a perfect capital market, the amount of on-the-job training provided by firms will be optimal(2). But capital markets usually are far from being perfect and therefore firms will generally pay for on-the-job programmes that increase the productivity specific to the firm. General training, which would increase productivity for a large number of firms, will not be undertaken by a single firm unless that firm has a very large share of the market. Thus, general training must, to a large extent, be financed outside firms. Such training will often take place within an informal system of adult part-time educational programmes. In most developed countries, this type of programme has already developed extensively in terms of the number of people participating. The enrolment figures are rapidly approaching the number of participants in full-time educational institutions(3). Statistics on the number of people taking part in such programmes distributed by age and subject-fields will be useful additions to the information on the number of people involved in on-the-job training. However, neither the amount of on-the-job training nor the more informal training undertaken by adults would be sufficient, as seen from the society's point of view, for firms are unwilling to pay for general training and also the amount of general training needed could not be

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1) This is a statistic since its actual size can hardly have normative significance.

2) G. Becker, op. cit. Even general training will be provided in efficient amounts in such a market because the trainees will be willing to accept a reduction in their wages during training.

3) In the United States the enrolment figures for adult part-time educational programmes exceed those of full-time institutions. See S. Moses: "The Learning Force: An Approach to the Politics of Education", Educational Policy Research Center, Syracuse University, New York, 1971.

supplied by informal part-time educational institutions where individuals bear all the costs themselves. Thus, there is a need for more educational resources for the adult population over and above the supply from sources already mentioned. This explains, to a certain extent, the rising interest in the idea of recurrent education. In addition to the two statistics already mentioned, the number of people participating in full-time education in full-time adult educational organisations can be added.

h) The Difference Between the Educational Level of New Graduates Entering the Labour Force and the Average Level of Education of the Employed Population

In order to measure the need for adult education as a whole, i.e. on-the-job training in firms, part-time adult education outside the full-time system, and public education for adults within this system, it might be useful to consider statistics such as 2(g). This indicates the difference between the average level of education of new graduates and the average level of education in the labour force and population. In this measure we would include the education obtained through on-the-job training, part-time adult education and, (where it exists), full-time adult education. Even this information would not be sufficient. Additional information on obsolescence would have to be obtained within specific vocations and professions by examination of the supply of new graduates into these fields and age distribution within these fields. This statistic should be used very carefully. Since experience is a good substitute for formal education, in many instances a difference such as the one suggested here will not necessarily signal a need for re-training, or obsolescence.

i) A Measure of Flexibility

If we assume that students are influenced by labour market conditions in the choice of educational careers, it is important that they should be able to transfer to other careers if the labour market conditions change. Transfer possibilities within the educational system would thus contribute towards an efficient allocation of educated labour. We propose to measure the degree of flexibility by the correlation between changes in the distribution of students on career patterns and changes in earnings of people with this education in the labour force. For an actual construction of such an indicator see Blank and Stigler.

j) Informational Feedback

In an educational system where the satisfaction of private demand for education is an important goal, feedback of information from the labour-market to the educational system will probably be needed. A system of indicators which will provide necessary information has been proposed, but we also need a feedback mechanism. This can be provided by creating information centres where students are counselled on career possibilities. As an indicator, the number of persons engaged on such tasks in different educational sub-systems relative to the size of the system might be proposed or, alternatively, the proportion of overall resources devoted to this activity. The problem with this is that it is a pure input indicator. A more appropriate statistic might therefore be the frequency of contact between people responsible for labour market information and clients of the educational system.

To complete this chapter, we summarise the suggested indicators and statistics measuring the economic contributions of education:

1) Contributions to Economic Growth

a) Measures for which more research is needed before they can be established as indicators:

- The contribution of education to production within industries at a disaggregated level.
- The allocative ability of different types of education.
- The proportion of difference in income per capita in country j and reference country which can be explained by differences in human capital.

b) Various indicators of the quality of the labour force.

2) Efficient Allocation of Labour

a) Rates of return and cost-benefit ratios for different levels of schooling and different types of education at each level of school.
b) Variance of earnings by education and occupation. Ranking of earnings and total costs.
c) Unemployment and vacancies of labour according to educational background and occupation.
d) The distribution of school-leavers by educational background and occupation.

e) The rate of migration of people with different educational backgrounds.

f) The distribution of the labour force on educational backgrounds for countries at different levels of economic development.

g) The amount of on-the-job training, by occupation and industry.

h) The differences between the educational level of school-leavers entering the labour force and the average level of education of the employed population.

i) The flexibility of the educational system.

j) The degree of informational feedback from the labour market to the educational system.

Except for the statistics 2(i) and (j) and the indicators for which more research is needed, the raw data requirements for the indicators and statistics we have proposed in this chapter may be summarised as follows:

For each individual we need: Education and on-the-job training, earnings, age, sex, occupation and industry.

For each educational career we need: Estimates of institutional costs.

This information could be regularly collected by annual sample surveys in most countries.

Chapter V

EQUALITY OF OPPORTUNITY

Equal opportunity refers to "the availability of places for students in the educational system, the social institutional support for attendance and the economic ability of individuals to pursue their education"(1).

First of all, we suppose that educational systems should allow equal opportunity of attendance. Then we extend this equalisation of opportunity to the more substantive claim that the allocation of resources should be similar between social groups(2). But we can consider something more. The usual suggestion has been that the ideal educational system would "... lead to the optimum equalisation of opportunities (i.e. would minimise the relation between social background and the dependent variables, particularly educational achievement)(3).

In extremo, under this system, life-chances would be determined by "inherent ability" (and not at all by the social origin of the child). On the other hand, if the objective is to give everyone equal life-chances, then, in a context where school "success"(4) partially determines subsequent life-chances, appropriate education would compensate for those "disadvantaged" a priori.

Equality of opportunity can mean several things and we should discuss the various meanings of "equality" and "equality of opportunity" before we decide which dimensions we are going to consider.

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1) See Conference on Policies for Educational Growth, Vol.IV, Background Report No. 4, OECD, Paris, 1971.

2) Note that this assumes that no social group has any special requirements, which might be challenged (see the discussions of I.Q. below).

3) R. Boudon in CERI paper CERI/EG/EO/70.01, OECD, Paris, 1970.

4) Similarly, success refers to monetary or status achievement and not the attainment of the "good life" which will be discussed.

The call for equal educational treatment, in terms of equal participation, and quality of education received, is predicated on a democratic sentiment that all people have the right to equal treatment. However, this is sometimes confusing for no one wants to maintain that men are empirically equal even though it may be argued that most empirically observed inequalities are a product of, rather than a precursor to, the existing social structure and the differential status of men therein. The call for equal educational opportunity is a prescriptive statement about the way men should be treated in an equal educational system. No one wishes to treat a blind child in the same way as a cripple: in fact, appropriate educational provision would imply unequal treatment on the basis of unequal needs. How does one define appropriate? If men were able to agree on certain minimum elements of what might be a common humanity, then they would want the educational system to distribute the material means for the satisfaction of these basic human potentials according to need, which would almost certainly imply unequally.

It is unnecessary, however, to discuss (and almost certainly disagree on) those things which constitute our common humanity(1) and how they should at length be realised without encountering a difficult boundary problem. For even in an affluent society there will be some individuals who will be unable to realise a socially acknowledged common humanity. Assuming that pre-natal interference in the problems posed by extreme individual differences is not proposed, to what extent should an attempt be made to rectify those differences which, in a given social context, are seen as disadvantageous?

1. PROVISION FOR THE DISADVANTAGED

At present, according to the available resources, societies attempt to provide special facilities for those seen in many different ways as disadvantaged. If it were possible to assign a limited objective figure to the percentage of a "normal" population which could be expected to suffer from specific afflictions, then it would be possible to measure

1) Very general, perhaps something like the capacity to feel affection or pain and the desire to establish a personal identity.

the concern of the educational system for the problem of equal provision of facilities by the proportion of handicapped for which the educational system provides special or adequate facilities. But, even leaving aside those disadvantages which are considered as socially determined, it is difficult to demarcate and lay down an objective list of physical and psychological disadvantages, let alone measure them. Indeed the trend in modern societies has been towards the recognition of an increasing number of physical and psychological "handicaps" as requiring special treatment. In other words, the claim that equality of the individual before the state should imply equality of treatment by the state is a defensible claim(1). A potentially unlimited list of exceptions to this implication must be recognised because of individual differences, and society must be prepared to take these differences into account in order to attain equality.

Instead of looking at the proportion of handicapped for whom an educational system caters, it should be possible to measure the concern of the educational system for the variety of provision required by different individuals by the extent to which it makes special provision for them. Obviously, this argument cannot be pushed too far(2), for general teaching is already individualised to some extent, and since the difference between some individuals in their receptivity to education is likely to be minimal, it would be unnecessary to provide explicit special provision. However, within the present ranges of educational systems, it would seem appropriate to measure the performance of the educational system by its provision of appropriate educational facilities and its concern with democratisation by the proportion of its resources devoted to special provision for those groups recognised as disadvantaged within the society.

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1) It is not sufficient just to say that equal treatment should be presumed unless a reason for it is advanced. For we do not recognise all reasons unless they are seen as relevant, and we cannot always specify the reason for differential treatment. Hart's concept of feasibility seems more appropriate here. See H.L. Hart, The Concept of Law, Oxford University Press, 1961.

2) Indeed this argument could be used to deny individuality to non-conformists by treating them as diseased. In this context excess provision for 'disadvantaged' groups may be a way of denying access to the schooling available for 'normal' children. In England, for example, West Indian children, on the basis of a supposedly culturally unbiased I.Q. test, are disproportionately allocated to ESN schools.

The alternative measure, i.e. the extent to which specific disadvantages are catered for, will not allow comparisons between countries which recognise different sets of "handicaps", and also makes comparisons over time difficult inside one country since criteria of eligibility for special treatment will change. If it were thought, however, that an objective list of disadvantages could be assembled and agreed upon among the Member countries and their incidence in the respective populations measured, then this would be the best guide. In the interim, the proposed measures (indicators) seem accessible and reasonable.

This discussion does, however, raise a problem for the remainder of the indicators when considering "normal" pupils and their ability to profit from forseeable educational systems.

We have to know how the ability to profit from education is distributed among the population. Despite the spate of recent research on I.Q. it is worth noting that:

i) The variance attributable to genetic factors allegedly varies between cultures, so that we do not know the limits of variance due to possible cultural environments(1).

ii) I.Q. and the ability to profit from education are not the same; there is considerable less evidence about the genetic determination of the latter(2).

iii) There is a wealth of "untapped talent" in different social groups which do not participate to the extent of their present capacities(3).

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1) For example, C.F. Burt, British Journal of Psychology, 1966, claims that 70 per cent of the variance in I.Q. scores is due to genetic factors. This is derived from a comparison of the correlations of I.Q. between relatives with the theoretical values deduced from the quantitative theory of genetics. But he has to assume that the present range of environments covers the potential range, and he makes the assumption that they should be scaled with the same standard deviation /15/ as I.Q. This is quite arbitrary: We have some idea of the potential variation from the spread of correlation coefficients in actual societies. (See S. Wiseman, Intelligence and Ability, Penguin, London, 1967).

2) Conference on Policies for Educational Growth, Vol. IV, Background Report No.10, OECD, Paris, 1971.

3) See, e.g. Crowther Report 1960 and its sample of National Servicemen, and D. Wolfle; America's Resources of Specialised Talent, New York, 1954. These figures, which indicate large reserve pools of ability, assume, moreover, a stable composition of society. See also P. de Wolff and K. Härnqvist, 1961, "Reserves of Ability" in A.H. Halsey, ed. Ability and Educational Opportunity, OECD, Paris, 1961.

It would seem that educational policy could therefore safely direct its efforts as if there were an almost limitless supply of ability. In these circumstances, within present ranges, an egalitarian society would aim at equalising attainment between social groups. This would mean that we should have to take into account the pre-school ability of different pupils to profit from education (which, of course, depends partly on social origin), in order to assess the appropriate resources required for an equal result. This could either be a strong claim about the equalisation of life-chances, or about just educational achievement (narrowly defined)(1).

Instead, however, we shall suppose that the differential ability to profit from education (whether measured by I.Q. scores, or a standard achievement test, or simply school grades in previous years) is a realistic constraint(2) within which educational systems operate. If such a measure is not available we can still use the indicators comparatively, since any genetic differences in ability between, e.g. people of different income backgrounds will probably exist to the same extent in most countries.

We then propose to distinguish three dimensions of educational equality, which can be considered as separate goals in their own right or as successive stages of democratisation.

i) Formal Equality of Access
(Where an attempt is made to reduce group disparities in enrolment ratios, or transition coefficients at the different levels of education for social groups defined with respect to age, sex, race, religion and social class).

ii) Equality of Content
(Where the resource input to different social groups at different levels of instruction is compared and equalised).

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1) It is interesting to note that an educational system oriented towards equality of result in terms of life-chances to compete for socially valued goods, is incompatible with a system in which access to these socially-valued goods is partially determined by the differential ability to profit from the educational system.

2) Note that this is a very unambitious level of equality; the argument is often in terms of equality (of whichever sort) regardless of I.Q. or ability. But such a goal would rapidly conflict with, e g. economic goals.

iii) Equality of Performance

(Where the educational achievement by social class, regions, sex, will be compared and equalised(1)).

These three dimensions of educational equality will be discussed in turn and appropriate social indicators suggested in each case.

i) Formal Equality of Access

Numerous studies have shown that mere participation in the educational system has had only a weak effect on the distribution of benefits which are supposed to accrue from participation in the educational system(2). If it is supposed that the educational system can have any effect at all on the potential "success" of individuals at later stages of their careers, then a prerequisite of effective educational intervention is attendance. Although not, in itself, sufficient, it is certainly necessary. So attendance ratios are one dimension through which the educational system has affected the absolute (if not the relative) life-chances of different groups. These are "stock variables", measuring attendance at one point in time.

It is equally important to know how these stocks change over time, and this change is measured by transition coefficients. These flow-variables are crucial because they show the direction in which the system is changing, and these are indispensable for planning, forecasting and policy decisions. However, very few countries have produced tables of transition coefficients, and then only for one- or two-year periods. Even fewer countries are able to produce transition tables on an annual basis. For th se Member countries unable to introduce an I.D. system(3), Richard Stone's approach would provide a good basis for statistical work in this area. Countries with I.D. systems, such as the Scandinavian countries, can go much further since they are not limited to the few variables that the Stone system accounts for.

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1) Some educational systems do not differentiate between leaving pupils, but all of them record achievement scores, and use some form of test to select for further education.

2) See Conference on Policies for Educational Growth, Vol. IV, B [illegible] Report No. 10, OECD, Paris, 1971.

3) An I.D. system is an individualised person data system. Many countries are not introducing these systems because of doubts about the wisdom of centralising access to too much information about individuals in the society.

Therefore, as indicators of formal equality we propose:

- Enrolment ratios at all levels and types of instruction by sex, race, I.Q., age and class of origin

- Transition coefficients (including entry and exit), by I.Q. race, sex and class of origin

For the construction of these indicators, we should require information as follows:

For the former: Number of students in each school broken down by age, sex, race, I.Q., and class of origin.
For the latter: Educational histories of each individual student.

ii) Equality of Content

Conditions necessary for equality within the educational system have been considered, but exactly what conditions are sufficient for this equality have not yet been defined. At first sight it would seem that, if the educational system maintained only a formal equality in terms of participation and flexibility, then it would be sufficient if it were to provide equally well-taught alternatives for all choices that individuals might make. It is instructive to look at the nature of this choice, however, and the limits placed on provision for all the different choices that might be made.

It has been shown that choice of curricula, and student aspirations about their future occupations are partially dependent on the class of origin(1). To some extent, student aspirations, and hence choice of curricula, also depend on students' scholastic achievement up to the choice point, which is partially determined by the class of origin. If we continue to pursue our goal of democratisation and attempt to attenuate the relationship between achievement and class of origin, it may not be desirable to let our educational policies, in terms of the kinds of education that are provided, be guided, even in part, by these same distributional inequalities(2). However, even in a society in which

1) T. Husén, op. cit., 1966, and E. Cohen, "Parental Factors in Educational Mobility", Sociology of Education, 1965.

2) We must clearly distinguish between aggregate individual demand for access to education and the content of individual demand in terms of students' aspirations. It may be that, in a perfect market, students will always be asking for those forms of education which the labour market can absorb, so that there is no apparent conflict between any of the goals. However, if we are emphasising the goal of democratisation, then we may not want to accept this demand at face value.

subsequent achievement depended only on innate ability and the educational system (and not on social origin), individual aspirations could be only partly satisfied because resources are limited.

What therefore does educational equality imply for the way in which an educational administrator should distribute the resources at his disposal? In the earlier discussion, it was maintained that the system should be oriented towards producing equality, and in the present social context, where the economic opportunities and social institutional support for school attendance vary between social groups, the educational system would be required to compensate for those so disadvantaged(1). Even if this argument were not accepted, it is hard to see how a position which did not propose at least equal distribution of resources between the different social groups could be maintained.

What should be counted as resource inputs? From the point of view of evaluating and guiding social policy, all those factors which are at least partly under the control of the educational authorities must be considered, and their comparative efficacy in affecting the performance of the system which, moving towards its desired goal, must be evaluated. As Cain and Watts(2) showed very well in their comments on the Coleman Report, we should not be concerned with the statistical significance of any particular variable or set of variables (for most variables will be significant given a sufficiently large sample) or, immediately, with the proportion of variance for which the variables account in determining the performance of the system (since this is of interest only if they are manipulable). In order to evaluate the performance of the educational system in attaining its desired goals, and to evaluate proposed policy innovations, it is less important to know the factors which affect performance than their comparative elasticities in affecting the desired performance and relative costs of the given changes(3). But in order to

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1) Examples of such programmes are "Headstart" in America and "Educational Priority Areas" in England. However, the major point at issue is still the equalisation of resource input.

2) See Technical Reports related to Background Study 11, Conference on Policies for Educational Growth, Vol. VII, OECD, Paris, 1971.

3) Many studies have concentrated on the proportion of variance which is explained by different kinds of factors in accounting for educational achievement, but, for our purposes, the only useful division is between those factors which we can manipulate and those we cannot. Moreover, if a manipulable variable happens to be multi-collinear with a non-manipulable variable, then the policy implications are unclear without further investigation.

do this we have to develop a correct structural model of the factors affecting educational achievement, which will include all the factors which monitor the state of the educational system.

Unfortunately, we have little idea how to affect the quality or quantity of output. In fact, most of the evidence about factors which were assumed to be related to performance of the system, especially in its teaching function, is partly negative(1). This may be because insufficient care was taken to control for multi-collinearity, or simply that sufficiently radical changes were not tried,so that until further knowledge is provided all resources must be assumed to be equally important. The alternative is to assume all resources are irrelevant, which seems counter-intuitive. These resources include:

Pupil and Teacher Time
Materials and Buildings
Quality of Teaching for the Child
Peer Group Influences on the Individual(2).

The first two kinds of resource can be measured in monetary terms, and can be related to any stage in the educational process by using a method outlined by Professor Stone. In a society with substantive equality we would expect geographical variations in the amounts spent on physical and personnel inputs, due to differences in sizes of school-districts; otherwise their values might be expected to be the same between social groups. Thus, the difference between resource input per capita in different social groups, and the change over time, would indicate the performance of the educational system in achieving substantive equality and indicate whether present policies allow it to proceed towards that goal. Another possible explanation of variations in expenditure might be that society does not regard substantive equality as a goal.

We could measure the quality of the teaching staff by their educational level, although the elements of the teaching production function are unclear, i.e. we cannot assume that increased qualification implies

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1) See for example J.S. Coleman, Equality of Educational Opportunity, United States Office of Education, Washington, 1966.

2) Note we have not included the home as a scarce input, though this is clearly very important. From the point of view of the educational system the attributes of 'good' and 'bad' homes (in terms of their offspring's educability) are exogenous.

improved teaching. But it is desirable to measure the receptivity and adaptivity of a pupil to his education environment which depends upon his interactions with the teacher(1). Measures of social distances between the parents and teaching staff were considered, but since there does not seem to be an agreed interval scale, they are of doubtful utility(2). It is important to gauge the integration of the pupil into the classroom group for this is likely to affect his adaptation to the learning situation(3). From Coleman's study it appears that the higher the average social class of the peer group, the better the individual performs. Of course, not everyone can be in a group of high average social class, and since the peer group influences are stronger on pupils of lower social classes, it is not clear what is the optimum distribution of students.

Neither is it clear what would count therefore as a measure of a "good" educational environment of teachers and pupils for an individual pupil, but it could be agreed that information on the educational qualification of teachers and the average social background of pupils in the class are required. Our proposed indicators are therefore:

a) Monetary resource input per child by sex, race, social class and region at all levels of instruction.
b) Educational level of teachers.
c) Average social class origin of pupils.
d) Proportion of educational resources spent on special provision for groups seen as disadvantaged by that system - (a measure of concern).

iii) Equality of Performance

Achievement Scores

Achievement scores appear in a different light according to whether or not one considers that the educational system should promote or provide equality. If the system should be educating for equality, then the

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1) D. Hargreaves, Social Relations in Secondary Education, Routledge and Kegan Paul Limited, London, 1967.

2) It is generally agreed that the perception of social distance is multi-dimensional.

3) J.S. Coleman, The Adolescent Society, Glencoe Free Press, New York, 1961.

comparative achievement scores at school will reflect the progress towards that goal; on the other hand, if the task of the education system is simply to provide equal services, then the achievement socres are of less interest(1). It may be necessary to ascertain the extent to which the provision of formal and substantive equality of opportunity affects the distribution of achievement scores and, of course, subsequent success; but this would not, a priori, be our goal. It would also be of interest to know how the rigidity of performance inside the educational system accom-odates itself with the policy changes that are made in the hope of attaining other desired goals. In any case, we shall assume that we shall be comparing achievement scores, even though their correlation with the probability of later "success" in life is fairly weak. We therefore need information about the subsequent life-changes of individuals from different social groups. We suggest that the collection of information on the distribution of educational backgrounds in different income-occupation structures be made by survey methods. If this information is extended to include details on the class of origin of the different income-occupation education levels, then some idea about the effect of education on the life-chances and mobility of different groups can be obtained. Much more information could probably be obtained on the subsequent occupations of different social groups from longitudinal studies, but this would be a costly effort and for the broad inequalities in which we are at present interested the proposed classification is adequate. Various matrix measures of social and occupational mobility have been proposed, and until further research demonstrates the process involved, the proposed indicators will probably be sufficient.

We therefore suggest the following indicators for measuring equality of performance:

- Achievement scores by race, sex(2), I.Q., and social class of parents at all levels of instruction.
- Occupation and income by different educational levels or achievement scores controlling for race, age and social class of parents.

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1) Some educational systems do not differentiate between leaving pupils, but all of them record achievement scores, and use some form of test to select for further education. See Chapter VII,"Education and the Quality of Life".

2) The reference to race and sex is not because we suppose that races and sexes are generally different in educational potential, but because the social correlates of these attributes are a powerful determining factor in education.

2. EDUCATION AND THE DISTRIBUTION OF INCOME(1)

All the previous measures are individual measures of equality. A dimension along which we can construct an aggregate measure of equal opportunity is the distribution of income. The organisation of education has considerable impact on the distribution of income through its influence on the distribution of earnings, in three different ways:

1. Through the influence of the allocation of labour.
2. Through financial support of students.
3. Through the production of skills and abilities.

We shall consider each point in turn.

1. An educational policy which ensures that the private rates of return are equal and independent of educational background will contribute to a more equal distribution of earnings, since earnings differences will be narrower in this case than when private rates of return are different. If the admission to some university faculties is restricted for resource reasons say, this will be equivalent to a restriction on entry into the labour market of people with those educational backgrounds which will show up in a high social and private rate of return. Friedman and Kuznets(2) have estimated that the restriction on entry to medical faculties in the United States led to an average income of doctors 20 per cent higher than the estimated income under conditions of free entry.

A statistic measuring this impact of education on the distribution of incomes would be the variance of the private rates of return for all types of education.

2. In order to induce people to undertake education and compensate for low income, financial support in the form of subsidies is often provided. Sometimes this has the unintended consequences of transferring income from the taxpayer to families with incomes higher than the average taxpayer or to students with potentially higher incomes than the average. We propose to measure this statistic by:

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1) H. Lydall, The Structure of Earnings, Oxford, 1969;
J. Mincer, "The Distribution of Labour Incomes : A Survey with Special Reference to the Human Capital Approach", Journal of Economic Literature, March, 1970;
L. Hansen and B. Weisbrod, Benefits, Costs and Finance of Public Higher Education, Markham, New York, 1969.

2) M. Friedman and S. Kuznets, Income from Independent Professional Practice, NBER, New York, 1947.

- Distribution of subsidies by family income of students.

3. More important than the two aspects described above is the influence of the educational system on the distribution of earnings through the production of skills and abilities. It is reasonable to assume that the dispersion of genetic intelligence is moderate, and perhaps approximately normal. This distribution of genetic intelligence provides us with a rough picture of the distribution of earnings which would follow if the provisions of skills were distributed only on the basis of genetic intelligence(1). If we however confront this dispersion of genetic intelligence with existing data on the distribution of earnings, we shall find that earnings in middle age may vary as much as 50:1. The shape of the earnings distribution is generally lognormal leptokurtic with a Pareto upper-tail. This difference between the distribution of earnings and genetic intelligence can to some extent be explained within a human capital model(2), where provision of education is more unequally distributed than genetic intelligence(3). In other words, as progress is made towards equality of educational opportunity the relationship between education and earnings, other things being equal, should produce a more equal distribution of incomes. We shall not touch upon the intricate problems of how to measure this relationship here. Different methods are described by Lydall.

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1) Of course, this argument depends on assumptions about the measurement of intelligence and its translation into the social and occupational world.

2) Except the Pareto upper-tail which can be shown to result from the income structure of hierarchic bureaucratic organisations. See H. Lydall, and H. Simon, "On a Class of Skew Distribution Functions" in Models of Man, New York, 1957.

3) H. Lydall, op. cit.

We conclude this chapter on equality of educational opportunity by summarising the indicators and statistics proposed:

Equality of Educational Opportunity

a) Enrolment ratios at all levels and types of instruction, by sex, race, I.Q., age and class of origin.
b) Transition coefficients (including entry and exit) by race, I Q., sex and class of origin.
c) Monetary resource input per child, by sex, race, social class and region at all levels of instruction.
d) Cultural congruence between school and children measured by educational level of teacher.
e) Average level of parents' education.
f) Proportion of educational resources spent on special provision for groups seen as disadvantaged by that system. (A measure of concern).
g) Achievement scores by social origin, race and sex at all levels of instruction.
h) Occupation and income by different educational levels or achievements, controlling for race, age and social class of parents.
i) Variance of private rates of return.
j) Distribution of subsidies by family income of students.

Raw Data Requirements:

For each individual in the school system:

— educational path and achievement scores, by age, sex, race, class of origin and I.Q.

If in the labour market:

— earnings by age, sex, education and occupation, social origin;

School data:

— number of students and unit costs for each educational level and educational type by sex, age, race, region, class of origin and I.Q.;
— number of teachers by sex, age and education.

Chapter VI

MEETING INDIVIDUAL REQUIREMENTS

There are two aspects of education as a service which we shall consider in this chapter:

a) Satisfaction of private aggregate demand for education(1).
b) The performance of the educational system for the individual.

We shall consider each of the sub-goal areas in turn and suggest appropriate indicators.

1. SATISFACTION OF PRIVATE AGGREGATE DEMAND FOR EDUCATION

The notion of a "demand" for education will include much that is avowedly economic in character, and therefore might be seen as belonging to the second of our goal areas. Competition, or demand for access to certain kinds of schools and colleges, will be sought by individuals because of the economic benefits education is expected to bring.

At the same time, individuals (and families) seek much more from education than just long-term economic rewards and, in the more advanced industrialised societies to-day where the economic rewards from education are taken for granted, an educational system will often be judged by its response to the individual's demand to satisfy his curiosity, and innovation, etc.(2). We have discussed in Chapter III the particular kinds

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1) The term "social demand for education" should no longer be used when referring to the aggregate individual demands. "Social" is the term used when we refer to the society as a whole, as distinguished from the individuals. We therefore propose to use the term "aggregate private demand for education" when referring to what was earlier called social demand.

2) This is related to our earlier discussions (in Chapter II) about the difference between needs and economic demand.

of knowledge and competences which the educational system is required to produce for its pupils; here we shall be considering the extent to which demand is satisfied. In theory we ought to specify this demand in terms of the particular achievements which parents expect of their children in the educational system, but we shall be considering only the aggregate demand. It is probably true that we could learn a lot by enquiring about consumer preferences independent of the 'market' - but we hesitate to suggest such a vast social survey.

Further, we should remember that the ability to satisfy this demand cannot be distinguished logically from the "price" the clients will have to pay for their education. If, in a society, all the cost connected with a certain education (institutional and opportunity costs)(1) is borne only by the society, the price for the individual (apart from the psychic costs) would be zero and the demand enormous. It is very unlikely that it would be possible to satisfy the demand in such a situation, and most probably it would not be regarded as a goal. If however the individual bore most of the costs, e.g. the opportunity costs, the potential demand might be reduced to dimensions where it would be possible to satisfy it, and therefore accept it as a goal.

In Chapter IV, where we discussed the relationship between the economy and the educational system, we introduced the concepts of private and social rates of return to education. An efficient structure of demand for education with regard to the economic benefits would require that if there were no risk, demand would be satisfied for a private rate of return equal to the social rate of return. In the case where other goals are taken into account and risks are introduced, this is not a requirement for efficiency. The influence of other goals implies that private rates and social rates of return are unequal because the influence would most probably differ from one education to another and may have different implications for private and social returns. People are uncertain about their income prospects i.e. investment in human capital is risky. It is therefore realistic to assume that, in order to induce people to undertake education which would yield a specific social rate of return, we shall require a somewhat higher private rate of return.

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1) Note that this implies paying students a wage equivalent to their potential earnings on the labour market or, alternatively extending the age limits of compulsory schooling so that no one would ever volunteer for education.

Most probably the existence of other goals would mean lower rates of return than in the case where only economic considerations count, since the existence of other goals would mean more education than would be required from an economic point of view. It would be useful however, to set up an index with regard to demand generated for economic reasons, as long as the deficiences of this are clearly stated. An ideal indicator of the demand for education would then be the ratio of the number of applicants after allowing for multiple applications to the number of places when the private rate of return minus risk compensation is equal to the social rate of return, which in its turn is equal to the required return on societal investments. If this ratio is 1, demand is satisfied. Objections can be raised however against using the social rate of return as a measure of education's economic benefit to society(1), although few would dispute that the private rates of return reflect the economic benefits to the individual. Also, estimates of the risk compensation needed will be exceedingly difficult to obtain so that a more realistic indicator could be:

i) The ratio of the number of applicants after allowing for multiple applications, to the number of places for a private rate of return equal to some preconceived idea of what is a reasonable economic benefit from education to the individual. When this ratio is 1, demand is satisfied.

These arguments, however, may be pushed aside as unrealistic or too narrowly conceived. We should be forced then to compare some measure of demand, without reference to price or benefits, directly to the actual number of places in the system. In this (straightforward) sense we should be able to measure the extent to which the demand is met directly as follows:

ii) The ratio of the number of applicants after allowing for multiple applications to the number of places in the different school sub-systems such as general secondary, vocational, etc by sex, race, social origin and region.

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1) See Chapter IV.

This index measures the extent to which aggregate private demand is satisfied, and acts as a guide to the amount of education that individuals in different areas, or from different social groups, would like to receive. If this ratio is greater than 1, then demand is unsatisfied, while for a ratio less or equal to 1, the school system is dimensioned to satisfy aggregate private demand for education. There are obvious difficulties in such a measure - whether or not an individual applies for a particular course of education depends not only on the economic factors mentioned above but also on:

- The availability of facilities and public knowledge about them. Lack of applications for an existing facility might simply be an indication of the informational flow to the general public, rather than an indicator of low social demand. Also, potential applicants may not take the trouble to apply if they feel the probability of acceptance to be small. Thus, existing facilities influence the propensity to apply and sometimes obscure the nature of pure demand.
- Aspirations depend on previous achievement and social origin. It is not, therefore, easy to gauge what affects the demand for educational facilities. With a shifting occupational structure, and an increasingly positive attitude to education, it is likely that the aggregate demand for education in terms of applications will outstrip the actual provision. New courses will continually be required, and this type of demand is likely to grow faster than facilities can be provided. Despite these disadvantages, this sort of statistic will be relatively easy to collect but it should be used with caution.

A way of overcoming some of the difficulties presented by the latter indicator may be an indicator based on sample surveys of adolescents, where they are asked to indicate their preferred educational career if confronted with a completely open system(1). Estimates of demand based on such surveys can be compared with existing facilities to obtain an indicator of satisfaction of demand equivalent to that based on applications.

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1) Research has shown that people are surprisingly realistic with regard to the choice of educational careers.

Although estimates of future demand for education cannot be based on present demand, there is evidence in the social process as involved which will allow us to forecast the trend in demand. This evidence uses the educational level of parents (an indicator of parents' aspirations) as the main determining variable. If this is so, we have a long lead-period (20-25 years) for forecasting, for the present educational stock in the adult population will indicate the potential demand for educational programmes in ten, twenty, or thirty years time. We shall be able to make more reliable estimates of the relationship between parents and children's educational levels when the results from longitudinal studies are available in many countries. (At present the demand for education in many countries is likely to increase faster than was previously the case because of a diffusion of the desirability of education)(1)(2).

2. PERFORMANCE OF THE EDUCATIONAL SYSTEM FOR THE INDIVIDUAL

We are not referring here to the requirements of, for example, specific groups of handicapped persons whose benefits from education may not, in the nature of things, enhance their economic position. Their needs have been discussed in Chapter V. Neither are we referring to intangible benefits such as "knowledge for its own sake", or "the quality of life"; these are discussed elsewhere in this paper.

The first aspect we have in mind is a demand for particular education which, while not falling short of the general level in scholastic terms, provides a specialisation sought only by minorities within the public.

The second aspect is the client-orientation of the educational system. A main characteristic of a service organisation is the importance of human contact, which can be measured in various ways. We are predominantly concerned, therefore, with the performance of the system for the individual.

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1) See Stone's model of the diffusion of education in a population in "A Model of the Educational System", Minerva, Winter 1965.

2) This is unlikely for the United States and Japan, but is probably correct for all European countries at the post-secondary level and for many countries at the secondary level.

The first aspect of the performance for the individual may be measured as:

i) Extent of provision for minority requirements

An example would be schools provided for the children belonging to religious denominations or minorities. Some educational systems aim at satisfying this "demand" more than others, but where this aim exists a likely indicator would be the extent of unsatisfied demand for such school places.

Another example would be schools able to cater for small minorities of children with outstanding artistic gifts, in fields such as music or dance. Few local areas are likely to contain such schools or be able to provide specialist instruction in existing schools; an indicator therefore would be the extent of public aid (travel grants, special teachers) made available.

ii) Measure of rigidity of different educational paths

Another aspect of flexibility in the system is the ease with which individuals can trace their educational paths through different levels of instruction. People change their minds and will want to be able to switch easily between different branches of study, without necessarily having to go back to the beginning in a new field of study. Thus an educational system, where a choice at a given level of instruction greatly restricts subsequent choice, will be seen as over-rigid. On these considerations, a theoretically simple measure of rigidity would be the extent to which individuals who start in a given stream of education remain in that stream until they leave the educational system altogether. Parallel streams of education do not necessarily last the same length of time; some of those who finish a short course will transfer to another and some will leave the system altogether. The rigidity of a parallel stream system may be measured by the ratio of the proportion who leave the educational system from the same stream in which they began, to the proportion of those entering any stream and who completed any course. This measure would normally be applied to compare the performance of educational systems at the secondary level where systems split into, say, vocational, academic, and general courses, and at the post-secondary level. The strength of such a measure is its simplicity, but this is also its basic weakness(1). The flexibility/rigidity

1) A high degree of "stream switching" may be symptomatic of frustrated authorities more than anything else.

of an educational system is a multi-dimensional concept, and this aspect will not be revealed by the simple measure proposed above. In fact, it is easy to construct examples of school-systems where an evaluation of the whole system simultaneously would lead us to conclude that the system is flexible, while our measure would indicate rigidity. It is therefore possible that the use of educational pyramids combined with a study of the selective instruments applied would tell us much more about flexibility/rigidity than the simple measure proposed above(1).

The following indicators of client orientation are proposed:

iii) The teacher/student ratio

This is a direct measure of the human contact element in educational organisations and, as such, a measure of the service aspect of education. To the extent to which the educational system functions for, e.g. custodial care, the teacher/student ratio will be an important indicator. The teacher/student ratio has been a popular indicator of the effectiveness/efficiency of various educational systems, a use which we regard as totally unjustifiable. Moreover, in this context, the efficiency or effectiveness of the teacher in the educational process is irrelevant. Another indicator which measures how the educational system directly caters for the individual student is an indicator such as:

iv) The number of hours available for individual counselling

Not only the student, but also the teacher is a client of the educational system, and a measure of how the teacher's needs as an individual are being satisfied may be an indicator such as:

- Proportion of teachers who annually leave the teaching profession (deaths and retirement excluded), by age, sex, educational level and school system.

As a summary we recapitulate the indicators we have proposed, and outline the raw data requirements.

Indicators

1. The ratio of the number of applicants to the number of places for private rate of return equal to some preconceived idea of what is a reasonable economic benefit from education to the individual.

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1) It is possible that graph theoretic concepts can be used, but we have not been able to consider that possibility in this context.

2. The ratio of number of applicants after allowing for multiple applications to the number of places in different school systems.
3. The equivalent to (2), but where the number of applicants would be substituted by the number of persons which, in a completely open system, would demand different types of education.
4. Extent of provision for minority requirements.
5. Measure of rigidity of different educational paths.
6. The teacher/student ratio in different school systems.
7. Number of hours devoted to individual counselling.

Raw Data

These would come from sample surveys and administrative statistics giving individuals distributed on demands for different types of education. Earnings after tax for individuals distributed by educational background. Breakdown of school time by educational purpose. Number of teachers and students in various school systems. Number of applicants and number of places in different school systems and levels. Demands for places, presupposing a completely open system (urveys). Number of teachers who leave the teaching profession for each school system.

Chapter VII

EDUCATION AND THE QUALITY OF LIFE

When educational planning was first taken seriously, the economic benefits of education were stressed. More recently there has been a tendency to attach more weight to the non-monetary aspects of the good life and to study how education can contribute to a good life. The original Latin meaning of the word "educate" was "to draw out", "to widen". Therefore, to limit ourselves to the aspects discussed hitherto is unnecessarily narrow. But the concept of the "whole man", or "the good life", is much more elusive when it comes to the contribution made by education than the goals considered so far.

First of all, we can assume that the dissemination of universal education has increased individual welfare. In other words, we believe education is a consumption good, so that education for its own sake is important. Further, the educational system attempts to provide equal opportunity to all, both to satisfy the democratic aspirations of society and to meet individual demand. However, this does raise a problem because in a society where individuals are graded according to some criteria of achievement (and a fortiori participation) in the educational system, there will be an ever-increasing demand for access to the means to meritorious grades. The solution to this dilemma of an insatiable private demand for education would be the dissemination of other values. How can the extent to which the educational system helps in diffusing other valued qualities of the good life be measured? (Whether or not one agrees with the argument above, one would most probably agree that the educational system should try to do this). Two difficulties arise:

- One cannot uniquely assign any part of the educational process to either achievement or non-achievement, in terms of subsequent monetary or occupational success. Many of the apparently "useful" subjects taught in the classroom situation are forgotten and never used and cultural skills learnt at school may allow the individual to participate in socially "correct" activities which are the pathway to success.

- It is not clear what would constitute a multiplicity of social gradings such as has been advocated. Until some composite measure of an individual worth which gives everyone the same value has been accepted by society, some one (complex) criterion will be chosen (on which individuals have different "scores") to determine the relative worth of individuals. However, if one has such a composite measure, interest in efficiency, and grading individuals will probably disappear.

Also there may be very strong disagreement on what constitutes a good life so that the indicators proposed here are in danger of being accepted only by very few. Be that as it may, we feel it is very important in this area to avoid the GNP trap, i.e. the problem that some important aspects will be left out because they are difficult to measure(1), so we propose to discuss the contribution of education within the following areas:

I. When some state is universally acknowledged as a good:

i) Health

Participation:

ii) Work
iii) Leisure.

II. The extent to which education contributes to the realisation of human potential: (Individual Development).

iv) Variety
v) Creativity
vi) Fate Control
vii) Disposition to Education.

There are some areas in which we should like the educational system to perform precisely because of its potential contribution to universally acknowledged social goods, and not for any reasons connected with the

1) Although, of course, it will be very difficult to measure intangible phenomena.

process of education itself. For example, it seems clear that everyone would like to be healthy, to lead an active life, and to use his leisure productively (in its widest sense). These are all elements of the "good life".

1. HEALTH

Studies of the relationship between health standards and various types of social differentiation (age, sex, social class), rest either upon: (a) Sample studies of health standards among the population, or (b) standardised mortality ratios. Sample or periodic studies of health are never complete; in other words, it is almost impossible to say whether one particular social group "enjoys better health" at a particular time than another group. Good health, in any case, is as much a subjective notion as an objective one.

This being so, comparisons which use standardised mortality ratios are the most common, measuring the mortality rate for a particular group as a proportion for a "standard" population with allowances made for the different age structures of the different groups, etc. Such studies show, in industrial countries, a clear correlation between mortality ratios and social class (measured in terms of occupation, and hence largely in terms of education). Put simply, persons in high-status occupations live longer, although the margin which they possess over low-status groups has become less marked in many countries in recent years. A recent Swedish report on the living conditions of the Swedish people(1) included a large number of health indicators, and measured the proportion of people within each social class who did not have good health according to each of these indicators. In most cases there was a very clear positive relationship between this proportion and low social class.

Further studies show that there is a relationship between social class and use of medical services(2) (access to doctor, to hospital, number of visits to doctor, etc.). This may be for a variety of reasons, including cultural patterns, income, locality and so on. An examination of the period during the 19th century in Britain, when death rates fell

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1) Låginnkonsatutredningen, Innenriksdepartementet, Stockholm, 1970.

2) Logan and Cushion, Morbidity Statistics from General Practice, HMSO, London, 1958.

dramatically, shows that medicine itself made a relatively minor contribution to this reduction(1). The important factors were improved diet and greater knowledge of hygiene among people. Other studies support this evidence. A study of life expectancy(2) for nations in the Western hemisphere showed that only two factors were significantly correlated with this dependent variable, i.e. potable water supply and literacy rate. In terms of "variation explained", literacy rate was the more important of the two.

Similar conclusions are reached in the United States(3), where mortality is used as a measure of the output of health. In this study investment in general education to reduce mortality appeared to be a better investment than that in improved medical services.

On the basis of this evidence, we therefore propose as an indicator education's contribution to the output of health, if this output can be measured.

There is another possible approach. Instead of measuring gains in health standards due to better education, it is possible to focus on specific instances where schooling tries to teach better health standards. One instance may be cited: there has been a campaign to teach children the rules of the road for pedestrians, and to inculcate road safety. Evidence now suggests that death rates among children on the roads have been cut, and there does not seem any apparent explanation for this other than in terms of the road safety campaign. Thus, a possible indicator that would seem to gauge the performance of the educational system in the field of health would be:

Reduced mortality, or reduced susceptibility, among people exposed to specific health campaigns in schools

Participation

ii) Work

iii) Leisure.

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1) T. McKeown and R.G. Record, "Reasons for the Decline of Mortality in England and Wales during the Nineteenth Century" in Population Studies, November, 1962.

2) C.T. Stewart, Jr., "The Allocation of Resources to Health", The Journal of Human Resources, Winter 1971.

3) R. Auster, J. Leveson, and D. Sarachik, "The Production of Health, An Exploratory Study", Journal of Human Resources, Fall 1969.

We believe that the ability of individuals to lead a varied and active life is one of the main concerns for those designing and planning the future. The present concern regarding "participation" or "representation" will presumably be articulated in particular forms: some will demand the 'right to work', others the 'right to leisure'. We shall consider these in turn. This is extremely difficult to measure objectively (as will be seen when leisure is discussed), but the main socially provided opportunity to be active in life is participation in the labour force. This could have been included in Chapter IV - Education and The Economy - but we have included it here because labour force participation has a more important bearing on certain aspects of social policy, e.g. participation in social life of middle-aged women, longer production life for both sexes, anti-poverty policies, etc.(1).

2. WORK

One may argue that work is a necessary evil and not an aspect of the quality of life; and in fact work in industrialised societies has been shown to be an alienating and depressing experience for many. We submit, however, that even if degrading and alienating aspects of work exist in modern societies, it is a good in itself with a high amount of welfare attached to it (for most people). The experience of mass-unemployment in the 1930s(2) and the hard-core unemployment of to-day show this. We shall suppose that the ability to participate in the labour force is a good per se.

Evidence(3)(4) shows then that the level of education is an important determinant of participation in the labour force. This is particularly marked among older men and among women, but even for males in their prime there is an association between labour force participation and educational attainment.

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1) There are difficulties here because highly developed industrial societies have developed a speciality of credentialism, i.e. the upgrading of educational qualifications deemed necessary as a criterion for entry to the same jobs, mainly as a rationing or screening device. Education assumes a degree of importance therefore as a measure of skill acquisition which should more accurately be attributed to a method of restricting entry to skilled trades or professions.

2) See for example D. Bakke, Citizens Without Work: A Study of The Effects of Unemployment Upon Workers' Social Relations and Practices, Yale University Press, 1940.

3) W. G. Bowen and T. A. Finegan, "Educational Attainment and Labour Force Participation", American Economic Review, May, 1966.

4) G.S. Lettenström and G. Skancke, The Economically Active Population in Norway 1960 and Forecasts up to 1970, Central Bureau of Statistics, Oslo, Norway, 1964.

The indicator proposed in this case is the rate of labour force participation by education level, controlling for other social factors.

3. LEISURE

The extent and use of leisure time, almost by definition, is an important ingredient in what we call "the quality of social life". Even if we ignore the well-known problems in defining leisure, we still face two difficult conceptual and methodological obstacles:

- What data or indicators can be used to ascertain the use of leisure
- What indicators, if any, will show the contribution made by education to the use of leisure time?

In the first instance, there is a substantial body of work in the social sciences which aims at depicting people's use of leisure time, and at testing hypotheses concerning the relationship between age, class, sex, type of work, and leisure patterns. Indicators of leisure which have been included are:

a) Time Measures:

Shown either by total amounts of leisure time available to the public at large, or by individual time budgets(1).

b) Money Measures:

Aggregate of consumer spending on leisure pursuits, or budget studies of individuals(2).

c) Activities:

Estimates of extent and range of use of leisure facilities.

d) Resources:

Measures of the extent of the available facilities for leisure use, e.g. land, building, reading matter, etc.

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1) UNESCO project, published by A. Szalai, American Behavioral Scientist, May, 1966

2) See G. Fisk, Leisure Spending Behavior, United States, 1963.

Given sources of data of this kind, it is possible within the existing state of knowledge to go further and to see relationships between socio-economic levels and particular patterns of leisure use. Research in the United States and United Kingdom, and no doubt in many other countries, provides evidence of this(1).

There are two difficulties in moving from this kind of data to the use of social indicators:

(1) That of the familiar problem of identifying the contribution specifically made by education to features of the life-styles of any socio-economic group.

(2) That of avoiding assumptions about one kind of leisure pursuit being preferable to another, assumptions which involve implicit élite values. This is not to argue that no preference should be expressed between different uses of leisure, but merely to suggest that these preferences should be made explicit and be justified: it should also be made clear that there may be general agreement on them within a particular group in society. In any case we suggest that use of leisure time, within what is generally called cultural activities, be measured by occupation, income, sex and education, which will then give us an indication of the contribution of education to these particular leisure activities.

One distinction drawn between different uses of leisure which may avoid the problem of élite assumptions is that of the active and passive uses of leisure(2), and more particularly in the field of recreation between participant and spectator sports. In many Western countries there is evidence to show that mass spectator sports have suffered declining audiences (football, rugby, cycling, athletics) but that the proportion of the population which actually plays or participates in a sport has increased.

This argument need not be confined to sport alone. In many countries the schools attempt to teach pupils to reach an excellence in one particular field of music, or even in some branch of social service, where these things are not central to the studies pursued by the pupil.

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1) H. Wilensky, "Mass Society and Mass Culture" American Sociological Review, Vol. 29, No. 2, 1964.

2) Note however that these very concepts have been used to describe social class attitudes to different activities, where upper and middle class people usually are described as active while the working class often is labelled passive.

Another possible social indicator of the relation between education and leisure would then be the number or proportion of persons who continued to follow some particular leisure pursuit or sport which they had learned at school or college.

Individual Development

We have attempted, as far as possible, to investigate areas where we can construct macro-measures. But even macro-measures are not always possible - particularly in the area of realisation of the individual's potential. We should attempt to measure the ways in which the school system fosters creativity, control over one's own destiny, etc. It should be noted that these all fall into the category of "expressive" activities - those which express desired states rather than being directly related to goals. These would normally be called "values", but we have tried to avoid too many problems of definition(1).

4. VARIETY

Consonant with an emphasis on education as being appropriate to individually different abilities we should expect the educational system to allow, within available resources, for the full development of individual talents. This would be facilitated by the variety and length of education provided (another dimension to the general flexibility of the system), and so on. Thus as indicators:

- Number of distinct types of courses and subjects.
- Number of compulsory subjects in general education.
- Number of school hours or proportion of school hours consisting of personal tuition or guidance.
- Number of years of unselective compulsory education.

5. CREATIVITY

Education's job is to prepare future generations for social structures and problems: these structures may be very different from ours. It may be that the skills required to tackle the problems of the future are not now available. It is therefore desirable to ensure that the next generations

1) There are problems however; it is considerably more difficult to measure the effectiveness of educational systems in expressing certain values than in reaching certain goals.

will be flexible in their approach to all social problems. An advantage would be to encourage creativity in the school system. Unfortunately, although the present stress on achievement within an established educational framework is likely to be counter-productive, we cannot measure (lack of) creativity(1). Furthermore, in general, an established framework is likely to militate against creativity; we have yet to conceive of institutions which promote change and creativity satisfactorily.

It was originally thought that the amount of free non-organised time would be a good indicator of the liberty allowed for children to innovate. But we should attempt to instill creativity into all parts of the educational process, and the idea that children are more creative in unsupervised play than at other times is naive.

We could do better, perhaps, by looking to the way in which the educational system either sponsors, or at least does not negate creativity. This would lead us to look at the stress on examinations as an outcome of school curricula, the type of achievement tests themselves (whether they are all multi-choice or whether they include personal project work, etc.). The danger with such a measure (which would seem technically possible) is that, since at present middle-class children will be more creative, this measure would be biased in favour of middle-class school systems.

Our best suggestion is that we examine the inputs to those progressive schools which claim creativity as a desired output and use these as tentative indicators.

6. FATE CONTROL

If one of the aims of the educational system is to produce autonomous people, then an individual's perception of his command over his own destiny is important. There is questionnaire material such as the I - E scale developed by Rottier at Yale for industrial situations. The latter found a scale which differentiated people well on "felt control" of their environment; but it is very suspect, for attempts at repetition in England have not been very successful, and if the questionnaire items are presented singly (instead of forced choices as with the original scale) discrimination does not appear.

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1) There do exist psychological tests which purport to measure the creativity of individuals. It seems unlikely, at the moment, that these will be cross-culturally valid.

As a consequence, some researchers in industrial sociology have proposed using acts of sabotage, as a measure of the individual's alienation from his workplace (L. Taylor). Along the same lines we could propose vandalism against school property and truancy rates as an indicator of lack of felt control over an important part of their lives by children.

7. DISPOSITION TO EDUCATION

This we regard as a very important goal. Education is regarded as having a value in its own right and one of the goals of the educational system should be to create a desire for education or an acceptance of education later in life. It is no longer possible to regard school education as providing a stock of knowledge to last one's whole life. Education must be regarded as a continuously on-going process throughout a person's life. Therefore the creation of a disposition to education must be regarded as one of the most important aims throughout the first period of attending school. Tentative indicators might be devised by looking at the proportion of the adult population who freely enrol for adult education courses, especially of the non-vocational kind.

Another indicator which may not be generally accepted, even in theory, is an estimate of the time-value spent by adults on educational activities. The amount of time can be estimated from time budgets, and the shadow price of time out of work can tentatively be set equal to the wage per hour of labour after tax. Thus, this indicator will not only vary with the amount of time spent, but also with the shadow wage-rates and the marginal tax-rates.

This indicator is based on the principle of optimum allocation of scarce resources. Time is clearly a scarce resource, and in theory people should therefore allocate their time-consuming activities so as to maximise individual welfare. Recent research(1) has been able to explain many broad aspects of contemporary behaviour, on the assumption that people behave as if time were a scarce resource.

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1) G. Becker, "A Theory of the Allocation of Time", Economic Journal, 1965.

If the theoretical basis for this indicator is accepted, it will also catch the time spent on education by those not attending educational institutions or registered for formal courses. Time spent at home on educational activities should also be regarded as a measure of the disposition to education so, in theory at least, this indicator should be more far-reaching than the first one suggested.

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* *

As a conclusion to this chapter, we recapitulate the indicators we have proposed:

I. i) Health

a) Education's contribution to the output of health.
b) Reduced mortality, or reduced susceptibility, among people exposed to specific health campaigns in schools.

Participation(1)

ii) Work

Rates of labour force participation by educational level controlling for other social factors.

iii) Leisure

a) Cultural activities by occupation, sex and education.
b) Proportion of persons who continue to pursue a leisure activity they had learned at school.

II. iv) Variety

a) Number of distinct types of course and subject.
b) Breadth, in terms of number of subjects, of compulsory education.
c) Length, in number of years of unselective compulsory education.
d) Amount, in number of school hours or proportion of school hours devoted to personal tuition or guidance.

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1) We should like to emphasise that "participation" as a future goal might take many forms: we have considered present definitions of work and leisure as prototypes only.

III. v) Creativity

a) Stress on examinations as outcome of school curricula as measured by proportion of school hours spent on non-examined topics.

b) Proportion of marks in achievement tests which depend on personal project work.

vi) Fate Control

a) Amount of vandalism against school property.

b) Truancy rate.

IV. vii) Disposition to Education

a) The proportion of the adult distribution on age groups who freely enrol for adult education courses, especially of the non-vocational kind.

b) Value of time spent on educational activities.

Raw Data Requirements

Education by age, sex, "health", occupation and industry.
Cultural activities by occupation, sex and education.
Use of leisure time.
Breakdown of school time by educational purpose for each educational level and type.
Truancy data.
Enrolment in adult education courses.
Time budget data.

Chapter VIII

CONCLUDING REMARKS

We have set ourselves the object of providing the basis for a statistical framework within which the educational policy-makers of OECD Member countries can evaluate their own performance towards their chosen goals in different goal areas. An attempt has been made in earlier chapters to establish a framework for evaluating the performance of the educational system in respect of five main areas and on the basis of the guidelines set down in the Conclusions to the Conference on Policies for Educational Growth(1):

> "Goals for educational growth and change in the 1970s should be made more explicit and where possible indicators which would measure the performance of the educational system, both in relation to educational goals as such and the contribution of education to the wider social and economic objectives, should be established".

We have suggested possible measures of performance towards possible goals in the belief that it is impossible to speak of satisfactory or unsatisfactory performance without some kind of measurement. In doing so, we have as far as possible presented output measures of the educational system, but statistics describing other aspects of the system have also been proposed.

We have not directed our efforts towards prescriptions for political decision-making, nor have we discussed the difficult problems attached to the weighting of different sub-goals, which is a task for the political decision-makers. This does not imply, however, that experts should not participate in that decision process. Indeed, it might be argued that it is their task to specify an alternative set of goals, with alternative

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1) Conference held in Paris from 3rd to 5th June, 1970: Conclusions in Educational Policies for the 1970s, OECD, Paris, 1971, p.136.

weights, and work out the feasibility of different alternatives. The consequences are then presented to the body politic. If these consequences are not the expected ones, the experts might then work out a new set of alternative goals and the consequences of these. This process will go on until a consensus is reached.

This theoretical framework necessitates clear and precise definitions of goals. Politicians will, however, for various reasons avoid being explicit about goals, because there are obvious advantages in not being so. Among the advantages of intangible goals are:

- Diffusely stated goals allow politicians more autonomy and more flexibility.
- Because of their vagueness, intangible goals seem to bring out compromise and integration(1).

We are not able to propose any solution to this problem here; we shall be content with stating it. Another problem we are not ready to analyse in detail, but which is still important, is whether the information system we have outlined in this paper, or any information system of this sort could, if constructed, be used efficiently within existing policy-making institutions. Considerable doubt has been raised lately(2)(3), as to whether the incentive system of present bureaucracies does not actually prevent the use of relevant information. If this is true, the introduction of information systems will have to be combined with organisational changes in order to serve their purpose.

In evaluating the performance of the educational system, we have stressed the importance of quantitative indicators. But however successful we shall be in obtaining these, there will still remain the need for informal judgement. In fact, the quality of this judgement will determine whether our statistical information system can contribute towards a more effective use of resources and improvement of education. We hope that by elaborating the consequences of some quite popular informal judgement we have contributed to general debate, and perhaps an improvement in the quality of that judgement.

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1) See R.E. Dror, "Some Characteristics of the Educational Policy Formation System", Policy Sciences, 1970.

2) D.K. Cohen, "Social Accounting in Education: Reflections on Supply and Demand", in Proceedings of the 1970 International Conference on Testing Problems, New York, 1971.

3) G. Tullock, "Public Decisions as Public Goods", Journal of Political Economy, July, August, 1971.

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